

# WHAT DIGITAL Camera

FEBRUARY  
2016

WHAT TO BUY TO USE IT



## Canon G5 X

Size of a compact, handling of a DSLR

### Winter wonders

14 ways to shoot this scenic season

Technique



### Secrets of the super-wides

Lenses that capture the bigger picture

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### Essential techniques

Improve your travel, portrait and macro shots



### Editing software

We round up the best of the bunch

### Nikon 24-70mm f/2.8

A first-class standard zoom



Technique

### Olympus Art Filters

Creativity at the push of a button



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Wondering about the latest gear? Find out how we rate 534 cameras and lenses



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**p54** Winter wonders**p23** Master Your Canon**p34** Expert tips**Tests you can trust**

To ensure the camera you buy doesn't disappoint, every camera that passes through the hands of *What Digital Camera*'s technical team is put through a series of tests. From high-spec DSLRs through to entry-level compacts, they are subjected to a series of rigorous tests in our lab, with results analysed by the very best industry software. This makes our reviews the most authoritative in the UK. We test for colour – different sensors and camera image processors can interpret colour differently. We then get down to the nitty-gritty of resolution, with our lab tests showing us exactly how much detail each camera can resolve. Then we look at Image Noise. Finally, we get out and shoot with every camera and lens in real-world conditions just as you will, to find out how they perform.

**COLOUR**

Subjecting each camera to our colour chart test reveals any variation and differences in colour between Raw and JPEG file formats.

**RESOLUTION**

Our resolution chart reveals exactly how much detail a sensor can resolve and it's measured in lines per picture height, abbreviated to l/ph.

**NOISE**

The diorama is used to ascertain how image noise is handled through an ISO range. Some cameras produce cleaner results than others.

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## APOY winner

Photographer Lee Acaster was recently crowned winner of the Amateur Photographer of the Year competition (AP is WDC's sister magazine). This gorgeous, ethereal shot came second in the 'In Focus' category. Lee won a Sigma SD1 Merrill and 17-50mm f/2.8 EX DC HSM lens worth more than £2,000. The 2016 competition launches in March, so why not enter? You have nothing to lose and (potentially) a lot to gain!









1



2



3



4



© MIKAEL BUCK

5



## 1 Top cameras on Flickr

[www.flickr.com](http://www.flickr.com)

Each year Flickr releases information about how the world is taking photos. This year's figures reveal 39% of all uploads were taken on a smartphone. Canon DSLRs were used for 27% of all photos on Flickr compared to 16% taken on Nikon DSLRs. Interesting info!

## 2 Manfrotto Lykos Panels

**£299** [www.manfrotto.co.uk](http://www.manfrotto.co.uk)

Available in daylight and BiColour versions, this LED light panel from Manfrotto features an output of 1600lux. It's Bluetooth-ready but a Bluetooth dongle will cost you an extra £75.

## 3 Hoya Fusion filters

**FROM £27** [www.intro2020.co.uk](http://www.intro2020.co.uk)

These new filters from Hoya feature a new anti-static coating that's designed to repel dust effectively. Each filter is made with a low-profile frame to eliminate vignetting and they'll be available in UV and circular polariser varieties. Sizes range from 37mm to 82mm.

## 4 Vatnajökull glacier

British photographer Mikael Buck explored Iceland's Vatnajökull glacier with Icelandic guides using Sony's Alpha 7R II camera. This image is part of a series of photographs taken in Iceland's otherworldly ice caverns.

## 5 SP Gadgets Mouth Mount

**£25** [www.sp-gadgets.com](http://www.sp-gadgets.com)

Ever thought of mounting your GoPro in your mouth? Well now you can, with this unusual accessory that acts like a gumshield with an attachment for a GoPro on the end. Designed for surfers and those who'd like to record for hands free, it's rather different from the norm.

## 6 GoPro app update

**£FREE** [www.apple.com/itunes](http://www.apple.com/itunes)

It's now possible to preview shots, toggle between capture modes and start/stop GoPro footage straight from an Apple watch. Just download the new GoPro app update.



6



## 9 Apple Smart Battery Case

£79 [www.apple.com/uk](http://www.apple.com/uk)

Apple has engineered a smart battery case specifically for the iPhone 6S and iPhone 6. Providing increased battery stamina, the soft-touch finish of the silicone exterior offers additional protection from damage. It'll be made available in charcoal gray and white.

## 10 Manfrotto bounce card

£25 [www.manfrotto.co.uk](http://www.manfrotto.co.uk)

This pocket-sized bounce card is designed to attach to all standard flashguns to create a softer light. It's worth a closer look if you regularly shoot portraiture or events.

## 11 Sports Photography

£50 [www.1-1000th.com](http://www.1-1000th.com)

Multi-award-winning sports photographer Bob Martin has published a new retrospective book called *1/1000th*, which brings together his most spectacular sports photography. Bob's images have graced the pages of countless publications and he has carved out a reputation as a photographer who is able to capture unique and captivating shots, whether it's at Wimbledon or the Olympics. It's quite a feat for a photographer who admits he's actually not that big a fan of sport himself. The book is a 240-page hardback and costs £50.

8



10



7



9



## 7 CommLite Nikon adapter

\$329 [www.commlite.com/en/](http://www.commlite.com/en/)

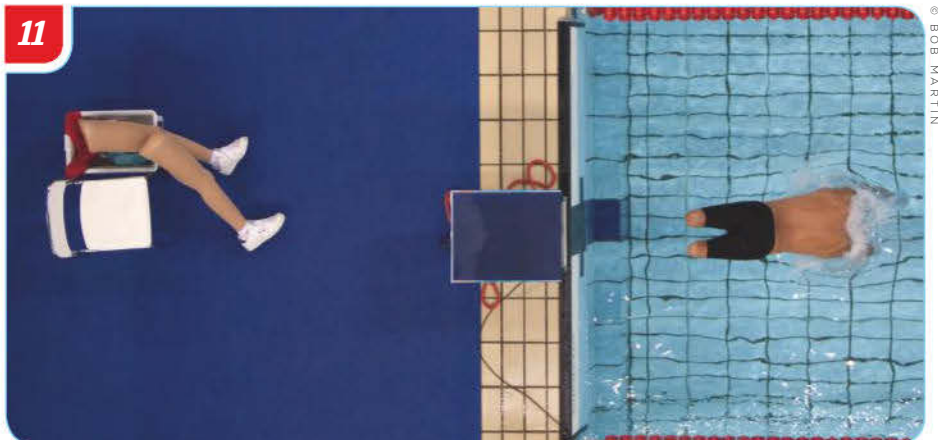
CommLite has released a Nikon F mount to Sony E-mount camera adapter, allowing Nikon users to connect their lenses to Sony cameras such as the A7 II, A7R II and A7S II. Autofocus, EXIF readings, aperture control and vibration reduction are all supported. It weighs 250g and features a detachable 1/4in mount foot for convenient tripod connection.

## 8 iON SnapCam LE

£179 [www.uk.ioncamera.com/snapcam/](http://www.uk.ioncamera.com/snapcam/)

Measuring 1.5in square, the SnapCam clips onto clothes and records Full HD video.

11



© BOB MARTIN



# Google Pixel C

[HTTPS://PIXEL.GOOGLE.COM](https://pixel.google.com) £399 (32GB)

Instead of continuing the Nexus line of tablets, Google has decided to go it alone and build what it thinks should be the mark at which other Android slates are judged. The Pixel C is a gorgeous, metal slab of tech that almost looks like a mini version of the brand's Chromebook Pixel.

The 10.2in 2560 x 1800 resolution display is slightly bigger than that of an iPad Air 2, making content even more immersive, whether you're touching up snaps or sitting back with Netflix. It's a bright panel too, and looks good even if



you're working outside.

Tucked inside is the super powerful Nvidia Tegra X1 processor which makes light work of even the most intense of applications, and the 3GB RAM is

sufficient for multi-tasking.

As you'd expect from a Google tablet, it comes running a vanilla build of Android. Version 6.01 Marshmallow to be precise, yet it lacks any of the split-screen goodness that lets you put two

apps side by side on iPads and Microsoft's

Surface. This lets the device down somewhat, but there are enough good apps on Google Play to make it forgivable.

Battery life is around 10 hours and a nifty keyboard dock available (for another £119) that attaches to the tablet through magnets. **MP**



## Sony Xperia Z5 Premium

[WWW.SONY.CO.UK](http://www.sony.co.uk)  
£629

A phone, with a 4K display? Nope, we're not joking. Sony has kitted its flagship device out with a frankly ridiculous 2160 x 3840 screen, far and away the most of any phone on the market.

When you're browsing the web or playing games, the Z5 Premium reverts to 1080p, but when viewing suitable content in Sony's built-in media apps it shows up in full 4K. It looks great – we just wish there was more stuff to watch.

Display aside, the Z5 Premium packs an impressive 23MP camera – of course, it's a Sony-made lens – that captures really detailed pictures whether it's day or night.

The Snapdragon 810 processor paired with 3GB RAM makes light work of anything you throw at it, and the 3,430 mAh battery can easily make it through the day, and into the next. **MP**

## Lenovo Yoga 900

[HTTP://SHOP.LENOVO.COM/GB/EN/LAPTOPS/LENOVO/YOGA/YOGA-900-13/](http://shop.lenovo.com/gb/en/laptops/lenovo/yoga/yoga-900-13/) £1,199

If you're not sure whether you want a tablet or a laptop, the latest addition to the innovative Yoga line from Lenovo could be for you.

It's a full on PC running Windows 10, that can be kitted out with one of Intel's latest Core i7 processors, up to 16GB RAM and a 512GB SSD; but it can also be flipped and folded around and used in all manner of modes, whether as a tablet, or a 'tent' which props the device up and lets you interact



with the touchscreen display like a canvas.

It's a great looking device, with a slick 360° rotating hinge. At 1.3kg it's pretty light and the metal finish makes it look almost like a MacBook.

An impressive, responsive backlit keyboard adds to the package, but the trackpad can't quite match up. It's prone to becoming unresponsive and often takes a few tries to successfully get it to click on something.

Thankfully, the 3200 x 1800 display is vibrant and crisp, with natural colours. Viewing angles are ace too and touchscreen is responsive. Brightness could be improved, but that's just a minor niggle. **MP**

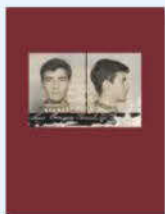
## BOOK REVIEWS

### MEXICAN CRIME PHOTOGRAPHS

By Stefan Ruiz

GOST BOOKS £26.36

In 2010, photographer Stefan Ruiz discovered these images as he was browsing the stalls of La Lagunilla, one of Mexico City's largest flea markets. Over the following months, Stefan purchased hundreds of these prints, many of which consisted of mugshots and crimes in progress. Each of



the images was taken between the 1950s and 70s. On the surface it's a book that features some interesting vintage images, but on a deeper level the collection illustrates a society that, in the eyes of the rest of the world, is unfairly defined by its criminal element. It's also a nice look

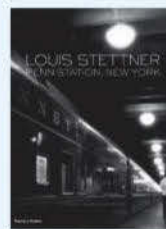
at how easily we elect our villains to the status of hero. It's difficult not to feel a tinge of seduction when flicking through the mugshots. This really is a fascinating and nicely produced little book. It is well worth your time. **OA**

### PENN STATION, NEW YORK

By Louis Stettner

THAMES & HUDSON £35

Continuing the theme of looking to the past, we find this strange yet beautiful collection of images from Louis Stettner, one of the last living members of the avant-garde New York School of Photography. Captured in the 1950s, the collection documents New York's now-vanished



Penn Station. While the station still exists, this project documents the station in its original form, a structure that became far too expensive to maintain. What's especially interesting is that when these images were originally taken they were not deemed newsworthy, and so remained unseen for many years. However, the project is now considered a major work of art and as a result we have this book, one that deals with the ghosts of memory. **OA**



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Canon EOS 7D Mark II Body **£1299.00**



## Nikon D810



Nikon D810 Body **£2349.00**



## Nikon D750



Nikon D750 Body **£1396.00**



## Canon DSLRs



EOS 1D X Body **£4399.00**



EOS 5D Mark III Body **£2249.00**



EOS 6D Body **£1119.00**

EOS 6D+24-105mm **£1499.00**



EOS 70D Body **£699.00**

EOS 70D+18-55mm **£734.00**

## Nikon DSLRs



Df Body **£1899.00**

Df + 50mm F1.8 **£1998.00**

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D4S Body **£4449.00**



D610 Body **£999.00**

D610+24-85mm **£1499.00**



D7200 Body **£752.00**

D7200+18-105mm **£889.00**

## Fujifilm Cameras FUJIFILM



X-T1 Graphite Body **£959.00**



X-T1 Black Body **£805.00**



X-100T Black/Silver Body **£796.00**



X-Pro1 Twin Lens Kit (Body + 18mm & 27mm) **£499.00**

## Nikon Lenses



Nikon 300mm F4E PF ED VR **£1639.00**

14-24mm F2.8G AF-S ED **£1315.00**

16-35mm F4.0G AF-S ED VR **£829.00**

18-35mm F3.5-4.5G AF-S ED **£519.00**

18-200mm F3.5-5.6G AF-S VR II **£534.00**

18-300mm F3.5-5.6G AF-S ED VR **£669.00**

24-70mm F2.8G AF-S ED **£1199.00**

28-300mm F3.5-5.6G AF-S VR **£655.00**

70-200mm F2.8G AF-S VR II **£1579.00**

70-200mm F4G AF-S ED VR **£789.00**

80-400mm F4.5-5.6G ED VR **£1799.00**

## Fuji Lenses



Fujifilm XF 16-55mm F2.8WR **£740.00**

14mm F2.8 XF **£629.00**

18mm F2.8 XF **£359.00**

23mm F1.4 XF **£629.00**

27mm F2.8 Black or Silver XF **£292.00**

35mm F1.4R XF **£367.00**

56mm F1.2 XF **£707.00**

56mm F1.2 XF APD **£899.00**

60mm F2.4R Macro XF **£407.00**

10-24mm F4 R XF **£707.00**

18-135mm F3.5-5.6 WR **£562.00**

50-140mm F2.8 WR OIS **£1059.00**

50-230mm F4.5-6.7 OIS Black or Silver XC **£299.00**

55-200mm F3.5-4.8 R LM OIS XF **£478.00**

## Zeiss Lenses



Otus 55mm F1.4 **£3170.00**

Distagon 15mm F2.8 **£2352.00**

Distagon 21mm F2.8 **£1449.00**

Distagon 28mm F2 **£979.00**

Planar 50mm F1.4 **£559.00**

Planar 85mm F1.4 **£989.00**

APO Sonnar 135mm F2 **£1599.00**

Makro-Planar 100mm F2 **£1449.00**

Otus 55mm F1.4 **£3170.00**

## Canon Lenses

EF 50mm F1.4 USM **£232.00**

EF 50mm F1.8 STM **£97.00**

EF-S 60mm F2.8 USM Macro **£305.00**

EF 85mm F1.2L II USM **£1499.00**

EF 100mm F2.8L IS USM Macro **£619.00**

EF 8-15mm F4.0L USM Fisheye **£899.00**

EF 16-35mm F2.8L USM II **£1064.00**

EF 17-40mm F4.0L USM **£498.00**

EF 24-70mm F4.0L IS **£675.00**

EF 24-70mm F2.8L II USM **£1400.00**

EF 24-105mm F4.0L IS USM **£727.00**

EF 24-105mm F3.5-5.6 IS STM **£375.00**

EF 70-200mm F2.8L IS USM II **£1499.00**

EF 70-200mm F4.0L IS USM **£795.00**

EF 70-300mm F4.0-5.6 IS USM **£356.00**

EF 70-300mm F4.0-5.6L IS USM **£894.00**

EF 100-400mm F4.5-5.6L IS USM II **£1844.00**

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## Try this... Replicate moonlight

This image by Ross Hoddinott, which was highly commended in the British Wildlife Photography Awards, was actually taken at daybreak. 'I shot this male demoiselle against the rising sun,' Ross explains, 'but later processed it with a cool blue cast to create the impression of moonlight.'

Visit [www.bwpawards.org](http://www.bwpawards.org) to see the complete list of winning images. *British Wildlife Photography Awards: Collection 6*, is published by AA Publishing, £25.

### TOP TIP

If you want to use a wide aperture when shooting into the sun, simply fit a neutral-density filter to the front of your lens. This will help to bring the shutter speed to within a usable range. A three-stop filter, for example, would bring a 1/8000sec shutter speed down to 1/1000sec.

*Nikon D800, 200mm f/4, 1/800sec @ f/4.5, ISO 400*  
[www.rosshoddinott.co.uk](http://www.rosshoddinott.co.uk)







## Try this... Include people for scale

Generally speaking, there's one thing landscape photographers aim for, and that's to exclude all signs of human life from their images. However, setting out to include them in your frame doesn't only increase the creative possibilities of your image, it also makes life a lot easier. Far better to time your shot so that people are at just the right point in the frame than to get more and more agitated as you miss the best light while waiting for them to leave the scene. In the case of this atmospheric image by Justin Minns, the two silhouetted figures add a sense of scale to the scene, highlighting the big sky and wide open space of the beach.

## TOP TIP

Ignore beaches during winter at your peril – you'll be missing some superb photographic opportunities if you stay indoors. Tide timetables are your friend. Visit [www.tidetimes.org.uk](http://www.tidetimes.org.uk) to coincide the best light with a low tide.

*Canon EOS 5D Mark II, EF24-105mm f/4L IS USM at 28mm, 1/250sec @ f/8, ISO 300*  
[www.justinminns.co.uk](http://www.justinminns.co.uk)









## Try this... Shoot a natural still life

Ever set out to photograph a grand vista, but things haven't quite lived up to expectations? Well, you're not alone. But don't pack your camera away if the light isn't doing everything you'd hoped it might. Instead, look for the smaller details that can create every bit as effective an image as a classic landscape scene. To shoot a close-up such as this, you'll still need to set out early, as delicate frosts tend to disappear as the day becomes milder. And think about light, too. Sidelighting from the sun will help to reveal texture. Fortunately, during winter, early-morning light is soft and thin, so you shouldn't need to worry about harsh, distracting shadows forming.

## TOP TIP

As Jeremy Walker says, 'Although a macro lens would be ideal, a set of relatively cheap extension tubes will enable you to get reasonably close to your subject. Also bear in mind that many modern zooms and primes can focus very close with no need for additional specialist kit.'

*Nikon D810, 45mm f/2.8, 0.6sec @ f/12, ISO 100*  
[www.jeremywalker.co.uk](http://www.jeremywalker.co.uk)



# Do you have any unwanted photographic equipment?



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# Image-editing software

We examine the best image-editing applications on the market and how they can be used to enhance your photos

WORDS ● AUDLEY JARVIS

If you want to maximise your photographic potential and create the best images you possibly can, then you really need to think about digital photography as a two-step process. First of all, there's the moment of capture, where the camera settings you apply will play a big part in how the image looks. And second, there's the question of what you do with that captured image afterwards, and the extent to which you choose to enhance it using bespoke image editing software. This is especially true for landscape, portrait and fine-art photography where subtle changes to colours and tones can often make or break an image, but also applies equally to other genres – such as reportage and street photography – where pressing

the shutter at the optimal moment is usually held up as the single most important aspect of producing a great photo.

While the most basic digital cameras are JPEG only, virtually all enthusiast-level digital cameras will allow you to record images as either compressed JPEGs or lossless Raw files. The main difference between the two is that JPEG images are processed in-camera with any excess data discarded so as to make the resulting image file smaller, whereas Raw files don't apply any in-camera processing yet retain all of the data captured by the sensor, which results in a much larger file. The additional data that a Raw image retains greatly enhances its processing potential, and for this reason most professional

photographers only ever shoot Raw so that they can apply their own unique look and feel to the images afterwards. If you want to get serious about your image processing, ultimately you'll need to do likewise.

Of course, there are occasions when shooting JPEGs is simply more convenient. The good news here is that you can still enhance your images to a degree, only not as much as if you were shooting in Raw. Deciding which format you want to shoot is entirely up to you, of course, and if you do decide to shoot JPEGs there are still plenty of image editors available that can help you to further enhance your images. Over the next few pages, we'll take a closer look at what these applications can offer you and what you should look out for ■

Image-editing software can help you boost saturation, increase contrast and clone out unwanted details – and that's just for starters

when deciding which one to use. On the final spread we've even collected together just under a dozen applications – from simple-to-use image editors that can be used for free, to much more costly and powerful applications that are routinely used by professional photographers.

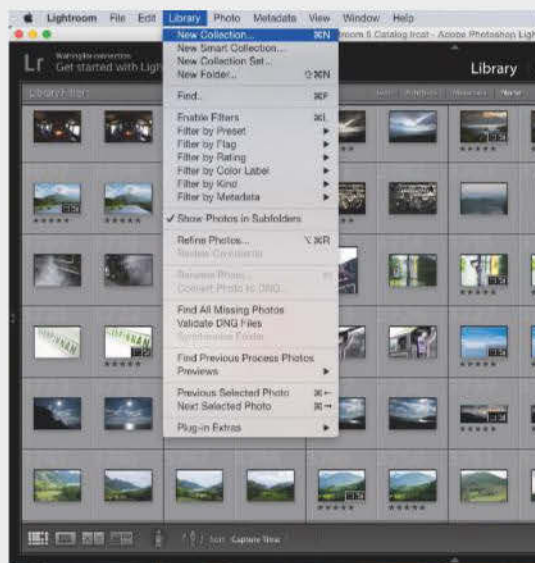
## Freeware vs paid-for applications

Image-editing applications come in many different guises and prices. And while some of the most powerful and advanced applications are undoubtedly quite costly, most manufacturers offer a free trial whereby you can download and use the application for a limited period of time, usually for around 30 days. This gives you time to evaluate the software, and to compare competing applications to see which one you find the easiest to work with and which is best suited to your needs. This applies to all the main professional-grade applications including Adobe Lightroom and Photoshop, DxO Optics Pro 10 and Phase One Capture Pro 8. It's definitely worth making use of these free trials before committing to a particular one. It's also worth noting that Adobe no longer sells boxed copies of its flagship application, Photoshop, instead requiring you to pay a monthly subscription to use it. While there was a fair amount of disquiet at the time the company announced its plans in 2013, monthly prices have since fallen to a much more reasonable level.

If your budget won't stretch to a paid-for application, then the good news is that there are plenty of open-source image editing applications that are free to download and use. While these 'freeware' applications aren't generally as powerful or as advanced as their paid-for counterparts, you may well find them to be sufficient for your needs. Ultimately, it all depends on what you want to do with your images. If you're only looking to make a few basic adjustments to JPEGs, for example cropping and minor exposure tweaks, then virtually all of the free applications will allow you to do this. Likewise, if you're simply looking to apply an Instagram style filter effect to your image, then there are hundreds of applications

# Cataloguing

While this guide is primarily concerned with applications that can be used to process, edit and enhance your images, one last feature we'd like to touch on that's well worth looking out for, but which doesn't necessarily come with all image-editing applications, is the ability to catalogue your images. This essentially allows you to organise and access them directly from within the image-editing application itself, rather than having to open other applications or search through multiple folders on your hard drive. This can greatly simplify the workflow process, making the most of your valuable processing time. Lightroom CC and Phase One Capture Pro 9 both offer pretty comprehensive image cataloguing features, including the ability to tag images with your own unique descriptions.



dedicated precisely to this, many of which are available for free.

On the other hand if you're looking to process large batches of Raw files, work in layers or make advanced colour profile changes, then you will almost certainly find a paid-for application a much better investment in the long run. As with all freeware, you should also exercise due diligence in what you download and where you download it from. Be especially wary of any freeware that requires you to download other applications as part of a bundle, as some of these may contain malicious code such as spyware or worse.

In addition to freeware applications, an increasing number of online editing applications – such as Fotor.com and Pixlr.com – have sprung up in recent years. Unlike regular applications that need to be downloaded to your computer's hard drive, online editors don't require you to install any software at all. Instead you simply upload the image you want to process to the host application's server and then edit it online through your internet browser, downloading the finished result to your computer once you're done. For the time being, online editors can only be used to edit JPEGs and often place a cap on maximum file size, too. While they're not ideal for large batches of

images, they do offer a relatively quick and easy solution if you only have one or two images that need a simple tweak. Of course, uploading your images to a remote server on the internet is not entirely without risk, and while most of the bigger and more established online editors explicitly state that they don't store any copies of your images, you should always read the terms and conditions and FAQs of any online image editor before hitting the 'upload' button.

## Basic and advanced adjustments

All image-editing applications will allow you to make a range of basic adjustments to your image. These are likely to include simple tasks such as cropping the image or applying a different aspect ratio to it, altering the overall exposure, boosting highlights, recovering shadow detail, or making changes to contrast, brightness and saturation levels. Most applications will use intuitive slider controls for this. Depending on how advanced the application is, you may also be able to alter the tone curve or make localised adjustments such as dodging (darkening) or burning (lightening), or even removing dust spots and skin blemishes.

Ultimately, though, you can expect to get what you pay for, and while some freeware applications (such as GIMP) are impressively powerful, they are generally no match for the advanced features and expansive toolsets found in

**“If you need to process batches of Raw files, a paid-for application is a better investment”**



professional-grade applications such as Lightroom CC, DxO Optics Pro and Phase One Capture Pro 9. Of course, given the more advanced nature of such applications, you can expect to spend quite a lot of time learning how to use them to their full potential, whereas for a simpler image-editing application the learning curve is far less steep.

More advanced applications usually come with the ability to apply masks or to work in layers, allowing you to isolate certain parts of the image and make adjustments without affecting the unmasked areas. This can be especially useful if you want to change backgrounds or help your foreground subjects to stand out from the background more. In addition, most of the advanced image editors will also allow you to make non-destructive edits to your images, which is to say you can make and save changes without affecting the original image. This is especially useful if you make mistakes or want to discard certain changes without discarding others.

## Raw conversion

If you're planning to invest in any of the more advanced paid-for image editing applications, then you really need to be shooting in Raw. This ensures that all of the data recorded by your camera's sensor is retained, providing you with much more scope to process the image as you would like to. This is especially true when it comes to enhancing shadow detail or recovering highlights, both of which are notoriously difficult with JPEGs that have already been processed in-camera. The flipside to this is that most basic image editors are JPEG-only, which is to say they won't recognise Raw files at all. For this reason, if you're planning to get serious about your image processing then you'll need to invest in an application that supports Raw.

As you might expect, there are some pretty big differences between the results each of the applications can produce, with some being slightly better at certain tasks than others. It's worth noting, however, that in such a competitive market, all of the manufacturers are constantly upgrading and improving their software and while DxO is generally regarded as being slightly ahead of the pack when it comes to the specific task of reducing luminance noise without sacrificina

### SCREEN CALIBRATION



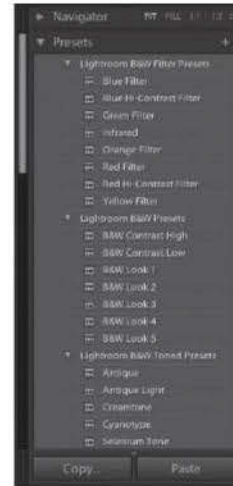
If you're going to get serious with processing your images, then it makes sense to ensure that your monitor is correctly calibrated. If not, then the colours you see on screen won't necessarily look the same in print. There are many products on the market to ensure that you don't fall into this trap. Among the market leaders are companies like Spyder, who make a range of screen calibration tools. The Datacolor Spyder 5 (£130) can be used to ensure that the colours you see on your display are the same that you will see in a print.

fine detail, that's not to say that next year's Lightroom or Capture One release will feature a big upgrade that makes it the class-leading application in relation to that same specific task.

There are many reasons – overall cost, ease of use, output options, catalogueing capabilities and suchlike – to choose one specific application over another, however it's much harder to definitively say that

one application is the overall winner and streets ahead of the others. Indeed, it's fair to say that the image-editing software market has evolved to the point where all of the key players excel at what they do. In addition, there are now many more companies producing excellent software that costs a fraction of their more established rivals.

Also, be aware that Raw files are proprietary in nature, which is to say they differ dramatically between the various manufacturers – a Nikon .NEF file, for example, is not the same as a Canon .CR2 file. In addition, Raw files often differ slightly between various camera models made by the same manufacturer, and for this reason there is often a short gap between a new camera's release and the ability of the main image editing applications to recognise the Raw files it produces. Some applications allow you to convert proprietary Raw file types to more universal Raw file types such as Adobe's .DNG format. There are many



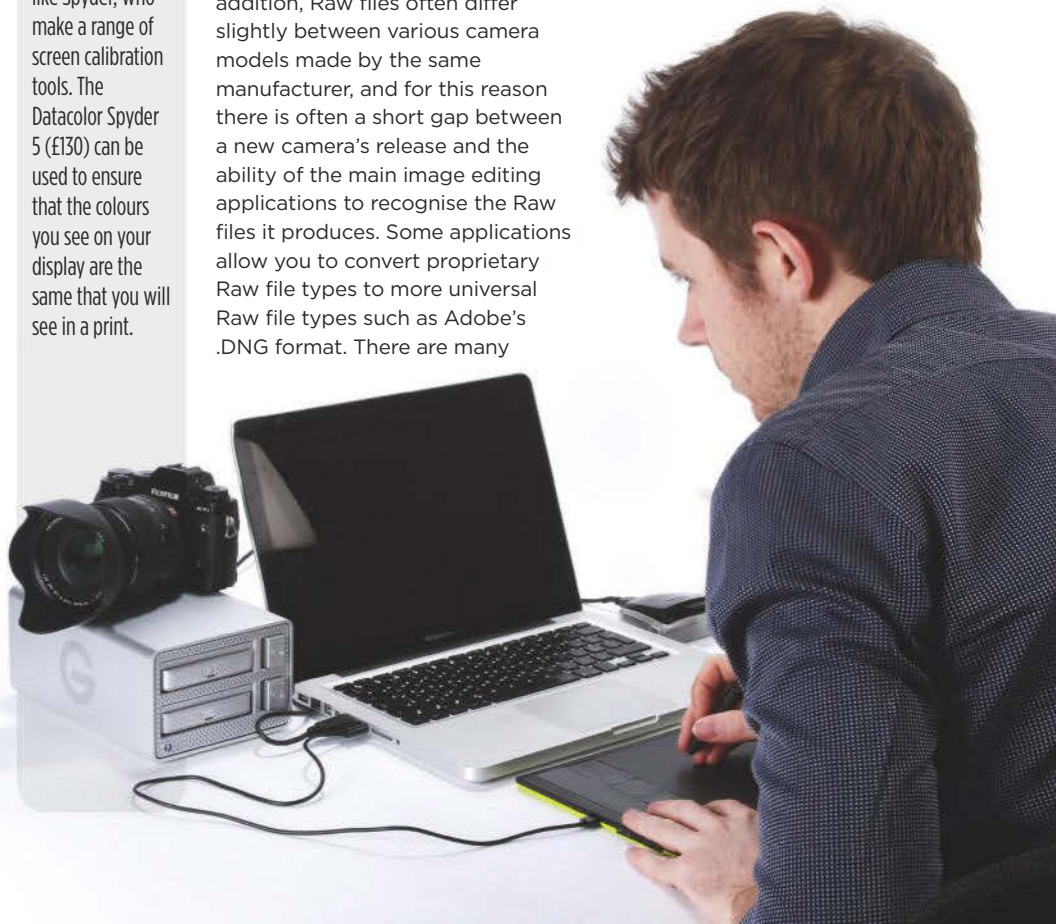
In Lightroom, users can organise specific edits in the form of Presets and re-use them

arguments both for and against this process and ultimately it's your choice whether to do so or not.

## Plug-ins

Another thing to consider when choosing image-editing software is its ability to support third-party plug-ins. Plug-ins come in many guises, although the most common types tend to provide digital filter effects, image upscaling and noise-reduction duties – all within the framework of your main image-editing application. Plug-ins can

be extremely useful in that they enable you to give your images a certain look with only a couple of mouse clicks, potentially saving you hours of fiddling about in Photoshop or suchlike. Others often handle specific tasks such as noise reduction or image upscaling better than their host application does. Numerous companies specialise in providing image enhancing plug-ins; however not all plug-ins are compatible with all image-editing applications. Lightroom though, has free presets that will help you speed up your digital darkroom workflow.



# Choose the software that's right for you

With so many options available, choosing the image-editing application that's right for you can be a daunting task. While Photoshop and Lightroom might still be the market leaders, that's not to say that there isn't an application that's better suited to your needs. On this page we've hand picked a selection of the best freeware applications available to download, which also includes a couple of useful online editors, while on the opposite page we've grouped together all of the market leaders in the professional-grade, paid-for applications market.



**GIMP Free**  
WWW.GIMP.ORG

Gimp is about the closest you can get to Photoshop for free – even the layout looks similar, with its familiar palette of healing, cloning and selection tools. In addition, GIMP also allows you to work with layers, which means you can cut out or isolate certain parts of your image to make changes to them while leaving other areas of the image unaffected. You'll also find a number of filter effects including ones for sharpness and noise control, as well as re-sizing and scaling options. While GIMP offers plenty of tools, the interface can be tricky to navigate if you're not already familiar with Photoshop.

KEY SPECS	RAW CONVERSION	Yes (via UFRaw app)
	BASIC ADJUSTMENTS	Yes
	FILTER EFFECTS	No
	LAYERS ADJUSTMENTS	Yes
	IMAGE CATALOGUING	No
	PLATFORMS	Mac and Windows



**Pixlr Free**  
WWW.PIXLR.COM

Pixlr is an excellent online editing resource that allows you to access and use two main applications via your internet browser: Pixlr Editor and Pixlr Express. The former is the more advanced option and uses a Photoshop-style layout to provide support for working in layers, while the latter is a more user-friendly application that still offers plenty of enhancement options, but presents them in a much more accessible way. Note that both applications are JPEG-only – you cannot use either to process or enhance Raw files. One further option worth noting is the Pixlr-o-matic desktop web app, which offers a range of one-click artistic effects.

KEY SPECS	RAW CONVERSION	No
	BASIC ADJUSTMENTS	Yes
	FILTER EFFECTS	Yes
	LAYERS ADJUSTMENTS	Yes
	IMAGE CATALOGUING	No
	PLATFORMS	Mac and Windows



**Picasa Free**  
WWW.PICASA.GOOGLE.COM

Picasa is a Google-owned photo management system that also offers some basic image editing tools. The photo management side of things isn't bad, and will find and organise all images on your hard drive, presenting a cascade of thumbnails in one centralised window for you to scroll through. The image editing side of things, however, feels pretty limited compared to some of the other applications listed here. Following the removal of the 'Edit in Creative Kit' option, what's left is a very basic smattering of enhancements and one-touch artistic effects. That said, Picasa is a good option for those that want to keep things as simple as possible.

KEY SPECS	RAW CONVERSION	No
	BASIC ADJUSTMENTS	Yes
	FILTER EFFECTS	Yes
	LAYERS ADJUSTMENTS	No
	IMAGE CATALOGUING	Yes
	PLATFORMS	Mac and Windows



**Apple Photos Free**  
WWW.APPLE.COM

Apple Photos combines the excellent image-cataloguing duties of iPhoto with a range of basic image-editing tools. Designed to work alongside Apple's iOS mobile platform, you can sync all your cameraphone-captured images to iCloud, which in turn syncs them to Photos so that you can view them on your desktop. Any edits made to any images will also sync across all your desktop and mobile devices, keeping everything up to date. While Apple Photos lacks the power and flexibility of Aperture, it remains a useful tool for iDevice owners who want the convenience of being able to view and edit all of their photos on all their devices.

KEY SPECS	RAW CONVERSION	Yes
	BASIC ADJUSTMENTS	Yes
	FILTER EFFECTS	Yes
	LAYERS ADJUSTMENTS	No
	IMAGE CATALOGUING	Yes
	PLATFORMS	Mac only



**Fotor Free**  
WWW.FOTOR.COM

Fotor is another online image editor that doesn't require you to download or install any software on your own computer. All you need to do is upload your chosen image to Fotor, edit it in the bespoke user interface via your internet browser and then download the finished result to your computer. As with Pixlr, the application only supports JPEG, although it does offer a good selection of basic editing tools. However, there's one area in which it really shines, though, and that's in its vast selection of one-click filter effects, which can be stacked on top of one another to give you a unique look.

KEY SPECS	RAW CONVERSION	No
	BASIC ADJUSTMENTS	Yes
	FILTER EFFECTS	Yes
	LAYERS ADJUSTMENTS	Yes
	IMAGE CATALOGUING	No
	PLATFORMS	Mac and Windows





## Adobe Lightroom & Photoshop

**£8.57 per month**

WWW.ADOBE.COM

Adobe's Creative Cloud Photography Plan bundles Lightroom and Photoshop together for a little under £9 a month. Since each application has its own particular strengths and weaknesses, the pair complement each other perfectly, providing everything you need to catalogue and process your images. On the one hand, Lightroom is a powerful Raw converter and non-destructive image editor that also takes care of image cataloguing duties, while Photoshop can be called upon for trickier image enhancements, such as those that require you to work with masks or layers. Both applications support a huge range of first- and third-party plug-ins.

KEY SPECS	RAW CONVERSION	Yes
	LAYERS ADJUSTMENTS	Photoshop only
	IMAGE CATALOGUING	Lightroom only
	PLATFORMS	Mac and Windows
	TRIAL VERSION	30 days
	ACTIVATIONS PER LICENCE	2



## Phase One Capture One Pro 9

**£195**

WWW.PHASEONE.COM

The Capture One Pro range began life as a tethered shooting application for Phase One's medium-format digital camera backs and has since evolved to become an advanced Raw conversion, non-destructive image-editing and cataloguing application that can be used with over 400 digital cameras. The latest version brings a new interface to the table alongside a newly designed processing engine that delivers enhanced contrast, exposure and brightening options, as well as the ability to perform localised tone curve adjustments. Also new is a masked layer tool that allows you to create layer masks by selecting an appropriate colour from the colour editor.

KEY SPECS	RAW CONVERSION	Yes
	LAYERS ADJUSTMENTS	Repair layer and Mask layer only
	IMAGE CATALOGUING	Yes
	PLATFORMS	Mac and Windows
	TRIAL VERSION	30 days
	ACTIVATIONS PER LICENCE	3



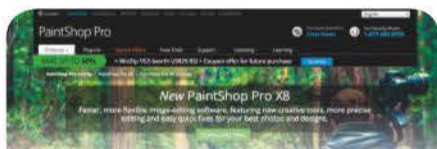
## DxO Optics Pro 10

**£99 (Essential)  
£149 (Elite)**

WWW.DXO.COM

DxO is well known for its scientific testing of digital camera sensors and lenses. Since 2004, the company has put the data gained by this process to good use by incorporating it into its DxO Optics Pro image-editing software, where it's used to make optical corrections specific to the lens and camera that were used to capture the image. While DxO Optics Pro 10 lacks the ability to make localised adjustments or any image cataloguing features, the interface is clean and can be customised to suit your needs. There are two versions of the software, with the cheaper version lacking DxO's excellent proprietary PRIME noise reduction technology and ClearView haze reduction feature.

KEY SPECS	RAW CONVERSION	Yes
	LAYERS ADJUSTMENTS	No
	IMAGE CATALOGUING	No
	PLATFORMS	Mac and Windows
	TRIAL VERSION	30 days
	ACTIVATIONS PER LICENCE	2 (Essential), 3 (Elite)



## Corel PaintShop Pro X8

**£59.99 / £79.99 (Ultimate Edition)**

WWW.PAINTSHOPPRO.COM

Originally launched as a low-cost rival to Adobe Photoshop, PaintShop Pro X8 aims to deliver the same functionality, supplemented by a range of other features. The main difference between the two editions is that 'Ultimate' comes with three extra applications: ON1's Perfect Effects 9.5, Corel AfterShot 2 and Aethetic Imaging's Perfectly Clear 2 SE. The first of these offers a wide range of digital filter presets, the second is Corel's own Raw batch conversion tool, while the latter offers a range of automated corrections. As for the main application, the interface is split into three tabs: Manage, Adjust and Edit. It's a comprehensive and cost-effective application.

KEY SPECS	RAW CONVERSION	Yes
	LAYERS ADJUSTMENTS	Yes
	IMAGE CATALOGUING	No
	PLATFORMS	Windows only
	TRIAL VERSION	None (30-day money-back guarantee)
	ACTIVATIONS PER LICENCE	Multiple



## Serif Affinity Photo

**£39.99**

WWW.SERIF.COM

Affinity Photo, which is designed from the ground up to work on the Apple OS X platform, provides Mac users with a cost-effective alternative to Photoshop. Despite being Serif's first high-end, Apple-only application, Affinity Photo has undergone lengthy beta testing to iron out any bugs and boasts an impressive set of features including expansive Raw conversion options, a generous toolset for non-destructive image editing, and full support for working with multiple layers. The customisable interface looks impressively slick too, and is designed to make the most of Apple's retina screen technology and 64-bit architecture.

KEY SPECS	RAW CONVERSION	Yes
	LAYERS ADJUSTMENTS	Yes
	IMAGE CATALOGUING	No
	PLATFORMS	Mac only
	TRIAL VERSION	30 days
	ACTIVATIONS PER LICENCE	2 (commercial use), 5 (home use only)



## ON1 Photo 10

**£80**

WWW.ON1.COM

ON1 Photo 10 can be used as either a standalone program or as a plug-in for Lightroom or Photoshop. If you want to use it as a standalone image editor, there's a Browse module that allows you to view all the images on your computer (including Raw files) with the ability to add keyword tags and ratings. In terms of image editing, there's a good range of options: Enhance takes care of Raw conversion and basic enhancements; Effects offers 23 stackable and customisable filter effects; Portraits offers portrait-specific enhancements; and Layers offers localised masking as well as blending multiple photos together.

KEY SPECS	RAW CONVERSION	Yes
	LAYERS ADJUSTMENTS	Yes
	IMAGE CATALOGUING	Yes
	PLATFORMS	Mac and Windows
	TRIAL VERSION	30 days
	ACTIVATIONS PER LICENCE	2

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# Railway photography with your **Canon DSLR**

Learn how to set up your DSLR to create atmospheric and timeless images at night

WORDS AND PICTURES **MICHAEL TOPHAM**

There are many photographers who will tell you that late autumn and early spring are the best times of the year to get out with your camera. While it's great to get up at the crack of dawn in order to shoot an early morning sunrise or head out late into the evening to capture a spectacular sunset, there's also a lot of satisfaction to be had from capturing a great shot in the dark winter months, which always seem to present a much greater challenge.

My passion for heading out into the dark on a cold winter night with my camera kit in tow started a few years back when I passed a preserved steam railway, which just so happened to be running steam locomotives throughout the night. Not really knowing what to expect, I immediately fell in love with the timeless atmosphere, the lingering steam, open coal fires and all the smaller details that made it feel as if I was living in a bygone age. I got so enthralled by it all I stayed for hours, experimenting with the length of my

exposures to capture the essence of everything that was happening around me. Returning home to find that I'd made an error of judgment in a few shots made me want to return and give it a second attempt – something I did with greater success. Just like any expert who takes years to refine their skill, I have made endless visits to preserved railways during the hours of darkness since, in an effort to learn the skills required to master railway photography at night using my Canon DSLR.

## The challenges

It's relatively easy to freeze a steam locomotive in its tracks and capture a sharp image during the day using a fast shutter speed, but it all gets a bit more complicated at night. You'll need your location and subject to be lit up like a football stadium if you're to achieve a pin-sharp, noise-free image of a steam engine travelling at speed, so you're better off concentrating your efforts on stationary locomotives and the smaller details that'll allow you to refine your technique and

composition. A preserved railway station is a great place to start and in the darkest winter months you'll usually get a few attempts to shoot the last trains of the day pausing briefly in the station. There's more to getting the shot than simply rolling up at your local station, though. You'll want to research the timetable first to ensure you're in the right place at the right time – and you'll find that most preserved railways publish this information on their websites so you can plan ahead before you arrive.

## Equipment

My experience of shooting railways at night has taught me to only carry what is absolutely necessary. Heavy and cumbersome telephoto lenses can be left at home and alongside my Canon DSLR, I pack a standard 24-70mm zoom and a wideangle lens should I find myself shooting in a confined area. You'll want to pack spare memory cards and batteries – it never ceases to amaze me how many frames I end up taking to get 'the shot' and if you're working in extremely cold temperatures your

You won't want to carry unnecessary kit on a night shoot. A standard zoom lens and a wideangle zoom should suffice for most types of shot. Here, a wideangle zoom was used to accentuate the corridor between the steam locomotives simmering in the shed



This classic railway scene was recreated on a photographic charter. My camera settings on my EOS 5D Mark III were 4 seconds @ f/5.6, ISO 800

batteries will have a tendency to discharge quicker than normal. By packing the bare essentials, you'll be able to fit your kit in a shoulder bag and not be weighed down by a cumbersome backpack that can get covered in coal dust and oil when it's put down in an engine shed. The other two items you won't want to leave home without are your trusty tripod and cable release.

### Getting set up

Once you have identified a scene that looks like it'll make a great shot, you'll need to get set up. After attaching your camera to your tripod you'll want to think carefully about the composition. Use the rule of thirds

## Photographic charters

For the ultimate railway photography experience, you'll want to attend a photo charter. These are private events specially set up for photographers by photographers who'd like to capture accurate recreations of railway scenes from the bygone age. Goods wagons, historic vehicles and railway men all dressed in appropriate clothing are organised to help set the scene. Exclusive track access, and in some cases additional lighting, will be arranged to get the best shots possible at the location. Most charters have a limited number of spaces so you'll want to book early and you'll need to pay around £30-£35 for an evening charter and £70-£75 for a full day. More info and examples can be found by visiting [www.flickr.com/groups/severnvalleyphotocharters/pool/](http://www.flickr.com/groups/severnvalleyphotocharters/pool/)

and don't forget to ask yourself whether the shot would look better in the landscape or portrait format. Frame up through the viewfinder and lock the camera off tightly. Failure to do so could result in the camera slipping during an exposure and cause unwanted blur that could ultimately ruin a shot. Attach your cable release and switch the camera on to check it fires the shutter. Next comes the challenge of focusing and getting the exposure spot on.

## Autofocus

Focusing in a dark environment is a great test of a camera's autofocus system. To ensure you get pin-sharp results at night there are a few simple steps you'll want to follow. Check your lens is set to AF first before setting the autofocus mode on your DSLR to One Shot, which will prevent the camera focusing continuously. Next, set the AF area mode to Spot AF. If you find your lens is hunting or your camera is having difficulty focusing, try positioning the AF point over a light source – station and engine lamps are effective.

By enabling the AF Beep on your camera, you'll also be able to listen for when you acquire correct focus. Carefully setting the lens to MF will then lock the focus and prevent your camera attempting to obtain focus every time you fire the shutter. You'll want to repeat these actions each time you compose a new shot otherwise there's a risk your next shot won't be pin sharp.

## Step by step

### How to take great railway photographs at night with your Canon DSLR

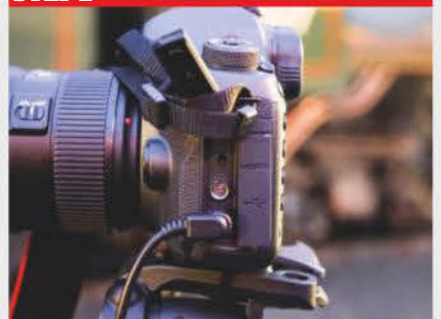
#### STEP 1



#### SET UP THE CAMERA ON A TRIPOD

You'll want to work with a versatile lens, so attaching a standard zoom is a good place as any to start. If your tripod has a tripod plate, fasten this securely and attach your camera to your set of sticks. Next, take time to carefully compose your image through the viewfinder using the rule of thirds. Lock your camera off tightly on the tripod to ensure there's no risk of it moving during a long exposure.

#### STEP 2



#### ATTACH YOUR CABLE RELEASE

Plug in your cable release, turn the camera on and check it's firing the shutter as it should. Head into your camera's main menu and double check you're shooting in the versatile Raw format. You may wish to shoot JPEGs as well as Raw files, in which case select Raw&JPEG. Shooting in Raw will allow you to take the finest control of white balance and exposure later in your software should you wish to refine it.





Old engine sheds are full of atmosphere and can present fantastic opportunities. My settings were 1/4sec @ f/4, ISO 800

## BEST PLACES TO SHOOT

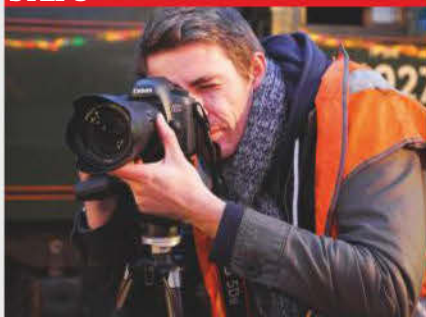
Few preserved steam railways run through the night, so one of the best opportunities for photographing a steam loco or station scene at night is during winter when it gets dark very early. The Severn Valley Railway in Worcestershire runs an all-night steam service as part of its four-day autumn gala, so if you're keen on capturing a series of great night shots, it's an event not to be missed. Next year's event runs from 22-25 September, so make sure you add it to your diary. Visit [www.svr.co.uk](http://www.svr.co.uk)

## Camera settings

There are no strict rules for getting a perfect exposure and your settings will vary depending on the scene and how light or dark it is. In twilight, for example, you'll be able to use a lower ISO than you would in an extremely dark scene with minimal light. My experience has told me not to use too long a shutter speed where possible. Shoot with a lengthy 25 to 30-second exposure and you run the risk of steam shrouding the locomotive and it'll take longer to write the data to the card. Trains can move without warning, so you will increase your chances of bagging the shot with a slightly faster shutter speed. A shutter speed of around 6-15 seconds is recommended. Setting the camera to Shutter Priority (Tv) mode and dialling in a shutter speed of 10 seconds with the ISO set to 800 is a good place to start.

I aim to shoot with an aperture of around f/5.6-f/11 to ensure the depth of field isn't too shallow in my images and that I preserve good edge-to-edge sharpness throughout the frame. There will be times, however, when you need to push beyond ISO 800 to achieve a large depth of field, so it's important to know the constraints of your camera's sensor and to what extent you can push the sensitivity. After taking a shot inspect it carefully and check the histogram for any blown-out highlights. If you're losing detail, dial in -1EV or -2EV of exposure compensation and take another shot.

### STEP 3



#### FOCUS ON THE HIGHLIGHTS

Check your lens is switched to AF and then set your Canon DSLR to its One Shot AF mode and check the AF area is set to Spot AF. It's helpful at this point to also check the AF Beep is enabled. Position the AF point over a highlight in the frame (a light source, lamp, or area of high contrast) and half depress the shutter to acquire focus. When the camera beeps, switch the lens to MF to lock focus and prevent it from hunting.

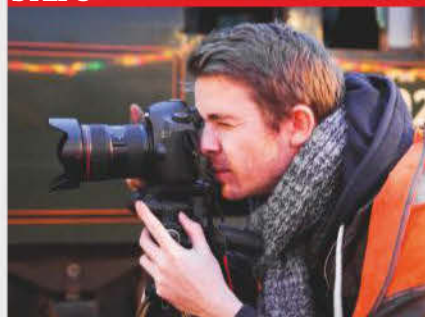
### STEP 4



#### DIAL IN YOUR EXPOSURE SETTINGS

Now set your DSLR's mode dial to Shutter Priority (Tv). Now set your DSLR's mode dial to Shutter Priority (Tv). Adjust the ISO so it's set at ISO 800 (a good starting point) and set the shutter speed anywhere between 6-15 seconds. Half depress the shutter to see what aperture value you get. You'll ideally want to aim for an aperture of around f/8. In order to create a wider aperture try lowering the ISO, whereas to do the opposite try increasing the sensitivity a touch.

### STEP 5



#### SHOOT, INSPECT AND ADJUST

Take a test shot and inspect your image on the rear display. If there's too much steam shrouding the locomotive, try dialling in a faster shutter speed and reshoot. Make sure you get into the habit of checking the histogram to ensure that highlight detail isn't being lost or blowing out. If it is, try dialling in -1EV or -2EV of exposure compensation. Take another shot to compare and adjust again if needed.

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## Amateur Filmmaker of the Year competition

Your chance to enter the UK's newest competition for budding amateur filmmakers

TO COINCIDE with the launch of The Video Mode website, we're pleased to announce our new Amateur Filmmaker of the Year (AFOY) competition. AFOY challenges you to get creative with your filmmaking, and gives you the opportunity to win some fantastic prizes worth £10,000 in total.

The competition is split into three rounds, each with its unique theme: Nature, Time and Love. To enter, submit a video no more than five minutes in length, of HD quality. You can shoot on any camera you'd like, and the content and editing are up to your imagination – so long as it fits

the round's particular theme.

Visit [www.thevideomode.com](http://www.thevideomode.com) to view the top videos, as well as the scores and a leaderboard for the overall competition. The winner will be the person with the most points after three rounds, who will win the overall prize as well as title of Amateur Filmmaker of the Year.

### Round Three: Love

We want to see how you convey your love for someone or something through film in a creative way for this round. Try using techniques such as 'lens whacking' or 'light leaks' to add that soft feel to your footage. For examples, go to [www.thevideomode.com/examples](http://www.thevideomode.com/examples).

### Rounds and dates

Below is a list of the competition rounds, their themes and the dates you need to know. To view the results, visit [www.thevideomode.com](http://www.thevideomode.com). When planning your entry, take into consideration the criteria of fulfilling the brief, creativity and technical excellence on which you'll be judged.

Theme	Opens	Closes
Round One: Nature	1 Aug	30 Sep
Round Two: Time	1 Oct	31 Dec
Round Three: Love	1 Jan	28 Feb

The overall winner will be announced in April 2016

### Prizes

Enter to win your share of prizes worth over £10 000! Here's what you could receive:

#### Round One

Canon EOS 7D Mark II, worth  
£1,499.99

Canon Legria Mini X, worth £329.99

#### Round Two

Canon EOS 5D Mark III, worth £2,499.99  
Canon Legria Mini X, worth £329.99

#### Round Three

Canon XC10 (with 128GB CFast card  
and reader), worth £1,999.99

Canon Legria Mini X, worth £329.99

#### Overall prize

Canon Cinema EOS C100 Mark II,  
worth £3,599.99

Visit [www.thevideomode.com/afoy3](http://www.thevideomode.com/afoy3)

to send us a link to your short film and to view the full terms and conditions

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# HDR and bracketing with your Nikon DSLR

You don't have to choose between preserving the highlights or shadows when you can shoot multiple frames and reveal detail in every area

WORDS AND PICTURES MARK HIGGINS

During the course of your photography, you will almost certainly have encountered scenes where brightness levels exceed the dynamic range of your camera: dark hills set against bright white skies; stained glass in dimly lit churches; figures reduced to silhouettes etc. Landscape photographers overcome this problem by using neutral-density filters to reduce the contrast between

When faced with a high-contrast scene, such as a bright sky against dark stonework, the camera has to decide between preserving detail in the shadows or the highlights. By using HDR, you can retain both

the land and sky, but there are other options. One of the most popular is a technique known as High Dynamic Range, whereby a series of images are taken, each with a slightly different exposure, and then combined to produce a single picture, rich in detail.

Before we take an in-depth look at HDR, it's important to understand why cameras struggle to record the same level of detail that we can see with our eyes. When we look at a scene our pupils adjust to allow us to make out fine details, regardless of light levels. Our eyes are also constantly shifting focus and taking in a broader angle of view than many camera lenses. Healthy human eyes can have a dynamic range of up to 24 stops (considerably more than a DSLR), and they also have the assistance of a brain to interpret what they see. Cameras do not have this luxury and when they are faced with scenes containing extreme brightness levels they have to choose between preserving details in the shadows (turning the highlights pure white) or preserving details in the highlights (turning the shadows pure black).

If you want to retain maximum detail in both the shadows and the

highlights you need to do one of three things: reduce the contrast in the scene until it falls within a range the camera can cope with, expand the sensor's exposure latitude in some way, or use third-party software to combine images taken at different exposures. Let's take each of these in turn. Firstly, you can reduce the contrast in a scene by using a neutral-density filter, moving the subject into the shade or introducing a diffuser. Secondly, you can expand the dynamic range of the sensor (or simulate this effect) by using the Active D-Lighting feature on your Nikon DSLR (see box over the page).

Thirdly, to combine images taken at different exposures, you might like to experiment with the HDR mode on your Nikon DSLR (located in the Shooting menu). Once activated, this feature instructs the camera to take two images at different exposures, and combine the results, without using third-party software. While this might sound like a win-win situation, it's restricted to JPEGs, and the only image that's saved is the final composite, not individual files. It's a great introduction to HDR, but for maximum detail and creative

control you need to shoot Raw and combine your images using dedicated HDR software, such as Photomatix Pro 5 (see box, facing page).

Before attempting HDR you need to think about what may (or may not) make good subject matter. If you're looking to do more than just reduce the contrast between light and dark areas (hills against white skies, for example) you might like to shoot reflective surfaces such as windows, glossy paint or metal. Using HDR will bring out every reflection your eyes can see, and even a few that they can't. In addition, textured surfaces such as stone, wood and bricks often work well. In fact, anything with plenty of detail is a pretty safe bet.

HDR involves shooting a series of images, each with a slightly different exposure, and combining them to produce a single picture – it's a good idea to start with just three frames

On the flipside, moving objects are best avoided. If your subject changes position even slightly during the exposures it can lead to ghosting – an undesirable artefact that will result in

hours of post-production work. This is particularly common in landscape or architectural shots where a bird might enter the frame – so look up before you release the shutter. (If you want

## Active D-Lighting

Another way of capturing more detail in shadows and highlights is to use the Active D-Lighting feature on your Nikon DSLR. Using one of five settings (older models have less): Auto, Low, Normal, High or Extra High, you can adjust contrast levels in order to essentially expand the dynamic range of the sensor. (If you want to apply Active D-Lighting to Raw files you need to use Nikon software.)

Press Menu. Locate Active D-Lighting in the Shooting menu and press OK to open the submenu (more recent models allow you to access this feature via the information screen too). (Menu>Active D-Lighting>OK).

Use the Multi selector to choose one of five strengths: Auto, Low, Normal, High or Extra High. Press OK. (Multi selector right>OK). Fire away.

An older version of D-Lighting (located in the Retouch menu) can be used to adjust contrast after a picture has been taken, but the results are rather heavy-handed, so it's best avoided if possible.

Exposed for the shadows



Exposure suggested by the camera



Exposed for the highlights



Final composite



## Step by step

### How to set up your Nikon DSLR camera for HDR

#### ONE



Mount the camera on a tripod. Select Aperture priority mode, and choose a mid-range aperture (such as f/11). Let the camera take care of the shutter speed, but make sure the ISO is as low as it can be (say, 100). Set Image quality to Raw, and pre-focus the lens by using Back-button focus or switching to Manual focus.

#### TWO



Take a test shot, and check where the highlights/shadows are lacking detail. Decide how many images you would like in your HDR sequence, and press the BKT (Bracketing) button on the camera body (if you're using a pre-D7000 model you might have to access this feature via the menu system).



to create an HDR action shot try using the Active D-Lighting feature on your camera, or shoot a single Raw file and create multiple versions of it in editing software, before combining them.)

Don't take these suggestions as gospel; it's important to experiment. Subjects that look unsuited to HDR can work well, while others that should work can sometimes fall short.

## Shooting your first HDR sequence

Shooting an HDR sequence requires preparation, but once you're under way it's a straightforward process. First you need to hold your camera steady, so you'll require a tripod – make sure the legs are firmly planted on the ground, not slowly sinking into soil. To reduce any internal vibration caused by the mirror flipping up during the exposure (or the shutter being fired) you can lay a beanbag on top of the camera, or use the mirror-lock up facility, but you only really need worry about this if you're using a camera with 36MP or more (such as the Nikon D800) which will capture every single detail, good or bad. It's also best to use the self-timer function or a remote shutter release.

With everything nice and steady, you can turn your attention to the camera settings. Aperture priority is a good place to start, with a mid-range f-stop of, say, f/11. Let the camera take care of the shutter speed. The ISO, however, should not be left to chance: set the lowest sensitivity you can, say 100. If there's any noise in individual pictures it will be multiplied in the composite. You're trying to catch as much detail as possible, so make sure

### DEDICATED HDR SOFTWARE

A variety of stand-alone HDR programs and plug-ins are available, but Photomatrix Pro 5 comes highly recommended. Both Windows and Mac versions are provided, for £72. Using this software you can vary the HDR look from natural to artistic, create custom settings, align handheld shots, remove ghosting, or take advantage of batch processing. It comes with a plug-in for Lightroom. Alternatively, you can buy Photomatrix Essentials (with a few less features) for £29.90, which includes a plug-in for Photoshop Elements. Visit [www.hdrsoft.com](http://www.hdrsoft.com)



To make the most of detail in textured surfaces like stone, and reflective surfaces like glass, shoot Raw and combine the exposures using dedicated software

that the Image Quality is set to Raw. The next job is to pre-focus, either by using back-button focus or switching to manual focus. Once again, it's all about consistency: if the lens tries to lock onto objects at different distances during the exposure sequence then the pictures will not line up at the end, and there will be a noticeable lack of sharpness.

At this point you need to decide how many images to include in your sequence. To begin with, it's a good idea to choose just three, but bear in mind that high-end DSLRs (such as the D810) have the capacity to shoot up to nine. The number you use will depend on the look you're after and, of course, the brightness levels of the scene. If you want the shadows and highlights to look relatively natural, then stick to just three or four images in your composite. But if you want a more graphic, cartoon-like look, experiment with more – you don't

have to use them all. Once you've made this decision you can activate Auto-exposure bracketing (AEB). In the sub-menu you will be given a choice as to how many stops apart each of the pictures should be. Again, it's down to personal preference, and the nature of the scene, but two stops is a good starting point. (The dynamic range of most modern sensors is so good that it will cover one stop either way anyhow.)

Once you have shot a sequence of images, play each one back on the LCD monitor. Check that you have all of the information you require: one showing detail in the clouds, one showing detail in the land etc. You can use the histograms of individual files to make sure that there is a good balance, but you can judge it pretty well from the LCD monitor too. Once combined, the files should result in a picture with bags of detail, and plenty of impact.

### THREE



On some intermediate and high-end Nikon DSLRs (such as the D5300) you can bracket White balance and Active D-Lighting, so make sure that the screen displays AE – BKT (Auto-exposure bracketing) in this instance.

### FOUR



When the Auto-exposure bracketing sub-menu appears, select the number of shots you would like in your sequence, and how many stops apart you would like them to be. Here we have opted for three frames at two stops apart.

### FIVE



Set the shooting speed to Continuous high (CH), so that all of the images will be taken almost instantaneously. Now fire away. Review your sequence on the LCD monitor and check that you have all of the information you require. Finally, combine the images using a software program such as Photomatrix Pro 5.

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# Using the Art Filters on your **Olympus**

Modern Olympus cameras come with a host of effects filters that can transform your shots. This professional photographer is sold

WORDS AND PICTURES **STEVE GOSLING**

Talking to other photographers about in-camera special effects has revealed that they are a bit like Marmite – you either love them or hate them. I have to admit that until a few years ago I fell into the last category. As someone with an aversion to HDR, pre-determined camera effects and software presets too, I had written them off as unnecessary, a marketing gimmick and aimed more at the casual snapper than the serious photographer (yes, I admit, I was a special effects filter snob).

That was until I started playing with the Art Filters on my Olympus PEN cameras back in 2011. I discovered

*Life Ring, Whitby – shot with the Colour Dramatic Tone filter and the border effect to make the most of the graphic shapes and bold colours (shot with PEN E-P3 and Olympus 9-18mm lens)*

that, like most prejudices, my negative opinion originated in ignorance. I'd never tried them before, having dismissed them as irrelevant to my photographic needs. Oh, how wrong I was! It was a conversation with another photographer that encouraged me to give them a try. I soon learnt to enjoy (dare I say, even love) the built in Art Filters.

And I'm not alone in experiencing this transformation. When I'm running my workshops for Olympus, I always enthuse about the Art Filters and I recognise the scepticism and sometimes looks of horror on the faces of some of the participants. Invariably it's those same people who curse me later in the day for

introducing them to this evil as they acknowledge just how addicted to them they have become during the course of the workshop.

My advice to any photographer is give them a try. Like any technique, you need to understand how they work, what they offer, what subjects they work with (and importantly the ones they don't). Once this understanding has been developed then it becomes easier to apply their use more appropriately – Art Filters then become just another option in the creative photographer's tool box. The skill lies in the selection of the correct tool for the job in hand.

In this respect my personal mantra is always this – 'subject first; technique second'.

Whichever technique (Art Filters or anything else) I'm using, it is never the prime motivator. For I believe that technique should always be subject driven; if it's not, then we are putting the proverbial cart before the horse. My first question when considering a shot is, 'What do I want to say about this subject and how can I best communicate that to my viewer?' The answer to this drives my approach to composition, lighting, equipment and technique. I believe that the ultimate requirement of any effect or technique is that it helps me to produce an image that reflects what I want to communicate about my photographic subject.

And when it comes to the Olympus Art Filters, I've found that some are just not for me at all, while others really suit my style of photography and help me to produce images that I'm very pleased with.

## What are the Olympus Art Filters?

The Olympus Art Filters offer a range of special effects designed to easily transform a 'straight' image into something a little more artistic at the simple push of a button or two.

The Olympus OM-Ds offer 14 Art Filters (see box, The Filters) and an Art Filter bracketing mode so you can easily experiment with a selection of filters to see their unique effect. In addition, each Art Filter includes optional effects e.g. a border, pinhole look, soft focus. As a result there are a huge range of options via different combinations. Experimenting and playing with the various choices is the best way of finding out your own personal likes and dislikes.

Ultimately, I recommend

☐ narrowing the choices down to a select few of your favourites and fully exploiting what they are capable of. I prefer to keep my choices to a minimum as I find having too many options can act as a barrier to getting to grips with the essence of the subject. So I've concentrated on the three Art Filters that seem to work best for me and my type of photography (see box opposite).

The Art Filters in use

The Art Filter menu can be accessed by turning the Exposure Mode dial to 'Art'. Pressing the OK button on the rear of the camera brings up the list of filter options and these are accessed by pressing the four-way control around the outside of the OK button (see Step by Step).

When using the Art Filters, a safe option is to set the camera to shoot Raw and JPEG files. The Art Filter is only applied to the JPEG, meaning you have the insurance of an untouched Raw file in case you look at the result and decide the use of a filter was too heavily influenced by your alcohol intake the night before!

It is also possible to just shoot Raw and apply the Art Filters to your image in post processing using the Olympus software. However, I particularly enjoy previewing the effects of the filter through the viewfinder or via live view on the LCD screen. This makes it quick and easy to evaluate whether a particular filter is working with a specific subject.

Occasionally, when using the filters I set the border effect on. This not only helps me pre-visualise what the final image will look like but it also imposes the discipline of getting the composition right in camera, as having the border can make post-

processing cropping difficult (there's nothing like a bit of self-imposed discipline to improve your photography!).

In compositional terms, I also love that I can set the camera to record and show a square image. As a photographer who grew up using square-format cameras (from a Lubitel TLR to a Hasselblad), I now see the world in this shape and I think the square format suits my minimalist and graphic style. Combining the square format with one of the filters (one of my favourites in this respect

is the Grainy Filter) takes me back to my days of shooting film. But of course the OM-Ds also allow me to set a range of other formats (i.e. 4:3, 3:2, 16:9) to suit the subject matter, thus giving me the best of all worlds.

And our experimentation doesn't have to stop with the choice of filter. As a creative photographer, I also like to adapt and amend techniques to produce images that are a distortion of what the eye sees and more closely reflects what I felt at the time of taking the shot. Capturing an emotional (rather than just a visual)

The filters

FILTER	DESCRIPTION	EFFECTS AVAILABLE
Pop Art	Super saturates colours (two filter types)	Soft focus; Pin Hole; White Edge; Frame; Star Light; Blur (Top & Bottom); Blur (Left & Right)
Soft Focus	Creates a dreamlike look	White Edge; Star Light
Pale & Light Colour	Introduces soft, flat light and pastel colouring (two filter types)	Soft focus; Pin Hole; White Edge; Frame; Blur (Top & Bottom); Blur (Left & Right)
Light Tone	Brightens the image providing more detail in the darker areas	Frame; Blur (Top & Bottom); Blur (Left & Right)
Grainy Film	Produces a gritty B&W film quality (two filter types plus the option to add tones or recreate B&W filter effects)	Pin Hole; White Edge; Frame
Pin Hole	Darkens the outer edges of the photograph (three filter types)	Frame
Diorama	Gives a miniature model feel by narrowing the depth of focus and enhancing colour & contrast (two filter types)	Frame
Cross Process	Changes the colour and contrast of the photograph (two filter types)	Pin Hole; White Edge; Frame; Blur (Top & Bottom); Blur (Left & Right)
Gentle Sepia	Gives warm & soft sepia cast retaining true blacks	Soft focus; Pin Hole; White Edge; Frame; Blur (Top & Bottom); Blur (Left & Right)
Dramatic Tone	Mimics HDR photography (two filter types)	Pin Hole; White Edge; Frame; Star Light; Blur (Top & Bottom); Blur (Left & Right)
Key Line	Shoots images that look posterised (two filter types)	Soft focus; Pin Hole; White Edge; Frame; Star Light
Watercolour	Removes dark areas and blends pale & bright colours onto a white canvas (two filter types)	Soft focus; Pin Hole; White Edge; Frame
Vintage	Creates an aged photo look (three filter types)	Soft focus; Pin Hole; White Edge; Frame; Star Light; Blur (Top & Bottom); Blur (Left & Right); Shade (Left & Right); Shade (Top & Bottom)
Partial Colour	Allows the retention of a specific colour whilst turning all the others to monochrome (three filter types)	Soft focus; Pin Hole; White Edge; Frame; Star Light; Blur (Top & Bottom); Blur (Left & Right)

Step by step

How to set up your Olympus to use Art Filters



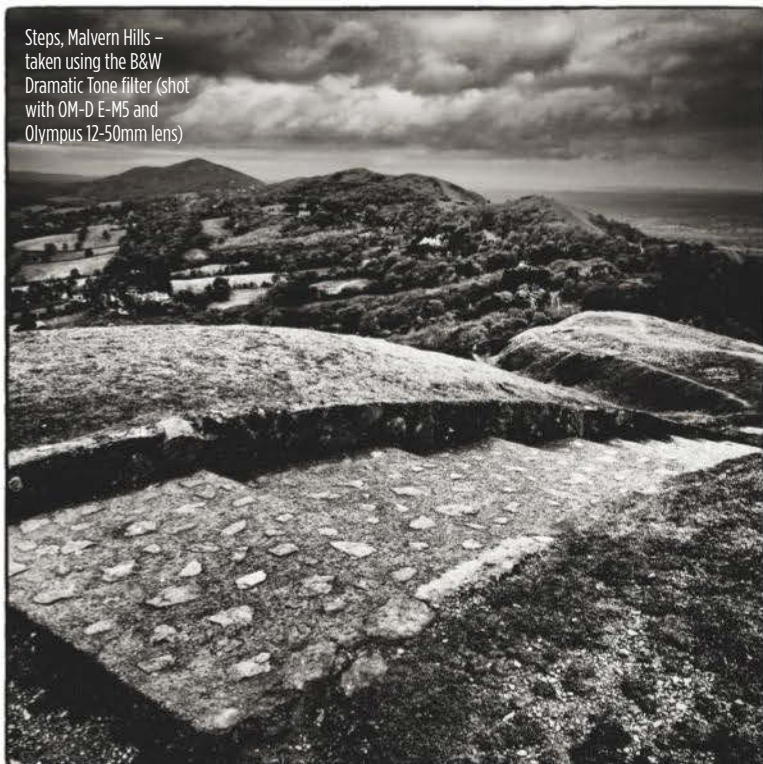
Select the Art Filter setting on the exposure mode dial.



Push the OK button and scroll down the list to choose the Art Filter required.



Steps, Malvern Hills – taken using the B&W Dramatic Tone filter (shot with OM-D E-M5 and Olympus 12-50mm lens)



response to a subject is what I strive to achieve in my photography. So experimenting one day I found that if I increased the camera's ISO setting to 1600 whilst using the Dramatic Tone filter, I ended up with a very painterly result. This certainly suited some of the landscapes I was photographing. And as a further extension of this, on a wet and windy trip to Scotland I played with a combination of the filter, an ISO 1600 setting and photographing through the wet windscreen of the car. The result? Some images that I love – because their impressionistic rendering captures the bleak, wet Scottish landscape so well.

My experience with the Art Filters

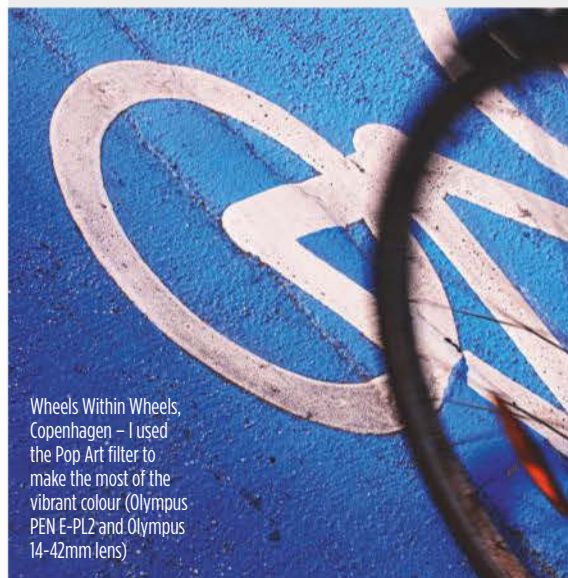
has been very productive – they are fun to use and promote experimentation. They have encouraged me to approach familiar subjects in new ways, to see the world through different eyes – as the great photographer Ernst Haas once said, 'I am not interested in shooting new things – I am interested to see things new.' As a creative photographer, this process of exploration and learning helps to keep my vision fresh and my motivation levels high. In enabling me to see, think and work differently, the Olympus Art Filters have helped to revitalise and re-energise my photography. And, from a former sceptic, that's recommendation indeed.

## My Favourite Olympus Art Filters

**The Pop Art filter.** I've described this as being like Fuji Velvia on steroids. It produces very vivid colours that just seem to jump off the screen. If realistic colour reproduction is your goal then this is not the filter for you! I wouldn't use it on a standard landscape, for example, because the colours can look over exaggerated. But photograph already colourful subjects (particularly those that are abstract and graphic) and the effect can be very dramatic.

**The Grainy B&W filter.** Images are superb straight out of the camera. In the past I liked the 'gritty' look of some medium to high-speed B&W films coupled with high-contrast printing and processing. This filter gives me similar results with little or no further manipulation.

**The Dramatic Tone filter.** I'm not usually a fan of obvious HDR type effects, so it came as quite a shock to me that I took to the Dramatic Tone filter. However it seems to suit simple, graphic, minimalist compositions and hence why I think it suits my style of photography. I particularly like the B&W version of the filter – it can produce very strong skies.



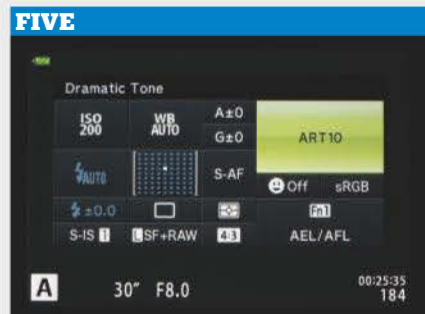
Wheels Within Wheels, Copenhagen – I used the Pop Art filter to make the most of the vibrant colour (Olympus PEN E-PL2 and Olympus 14-42mm lens)



Use the right control around the OK button to select the Filter Type (in this case the B&W Dramatic Tone Filter has been selected).



Customise the filter by adding an effect. To do this navigate down to the effects option and choose the desired option (here a frame effect has been selected).



Once a specific filter has been set up to your liking this can be quickly accessed again via the Super Control panel on the rear of the camera whilst keeping the camera in P/A/S or M modes.

# Expert tips

Over the next eight pages, a range of top pros give their insider secrets for improving your travel, portrait, macro and architecture shots



© GAVIN GOUGH



## Tea first, photography second

Gavin Gough

[www.gavingough.com](http://www.gavingough.com)

The best travel photography communicates a sense of place and shares something about the experience of being in a specific location. To make images that communicate effectively, you need to know what that experience feels like. Try to resist the temptation to begin shooting immediately. Put your camera away, walk through the markets, chat to the street vendors, explore the location fully, observe how the light falls and search for locations that will provide the best photographic opportunities.

I find that pausing for tea provides me

with the time to really observe a location and inevitably leads to conversations with local people, without the pressure of feeling the need to take photos. I know that the time I invest in exploring without a camera – when I can think about the light, about compositions and perspectives – will always pay dividends when I'm ready to start work. It also means that when I return to locations, when people might remember my face and an earlier conversation we enjoyed, they're much more inclined to work on creating a memorable portrait with me.



Without the distraction of colour, mono images can convey emotion and atmosphere better



# Travel

Technical knowledge, observing your location and balanced lighting are key



## Learn your craft and then be creative

Philip Lee Harvey

[www.philipleeharvey.com](http://www.philipleeharvey.com)

We should all know what we're doing technically as photographers, whether we're professionals or amateurs. You get so much more from photography when you're in control of your equipment. If you let your camera control everything, chances are you won't get the creative look you're after. So, the first thing to do is to turn off any automatic settings, and that includes semi-automatic exposure modes such as Program, Aperture Priority and Shutter Priority. I shoot in manual mode nearly all the time. It's fine being experimental and creative with your photography, but as a professional you need to be able to repeat it. So I decide what's in focus, I decide the exposure, and I draw upon an arsenal of other technical tricks without having to think.

With focusing, I prefer to use single-point AF, using the focus-and-recompose technique rather than continuous AF (although sometimes I use focus tracking for wildlife). I often use manual focus, too. I was photographing some hummingbirds recently and, as the birds move so fast, I switched to manual focus because I wasn't sure where they would come into the frame.

Take time to wander around your location before you start shooting



© LARRY LOUIE



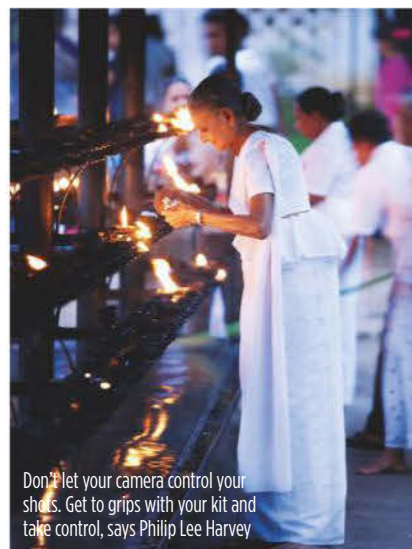
## Strike a visual balance of light and shadow

Larry Louie

[www.larrylouie.com](http://www.larrylouie.com)

I love the way black & white photography removes any of the emotion and feeling created by colour (a beautiful red sunset may evoke warmth and romanticism, for example). To compensate for this loss of colour however, a black & white image creates atmosphere and emotion through its subject matter and through lighting.

The photographer learns to see shades of grey and contrast, previsualising an image in mono before it's taken, but you must remember to watch how highlights and shadows are arranged within the boundaries of the image. That's not forgetting that positive space is as important as negative space, so you need to pay attention to the background as much as the foreground, as it plays an important role in the composition of the image. This is called visual balance.



© PHILIP LEE HARVEY

Don't let your camera control your shots. Get to grips with your kit and take control, says Philip Lee Harvey

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© JAKE HICKS

# Portraits

Clever lighting and simple tricks make for great images, say these professionals



## Use colour wisely

Jake Hicks

[www.jakehicksphotography.com](http://www.jakehicksphotography.com)

Using coloured gels in your portraits can be a great way of making images stand out, but don't underestimate the power that colour has on viewers' perceptions. Certain colours will affect us in certain ways.

For example, we all know red is a powerful colour, but depending on the context it can convey very different messages. If you use a lot of red lighting in a boudoir shoot it will convey ideas of love and lust, but red lighting used in conjunction with a boxer will portray power and anger. As a rule, reds tend to evoke energy and passion while cooler colours evoke calmer feelings. Because of this, you'll often see blues used in corporate photography.

As your confidence builds using gels, it's then possible to combine multiple colours but always keep the message you're portraying in mind.



## Recreate a Hollywood look

Damien Lovegrove

[www.lovegrovephotography.com](http://www.lovegrovephotography.com)

To emulate that glamorous old-Hollywood look, set the mood with the camera position. Shoot from below the eyeline to make someone seem powerful, statuesque, strong and confident. If you want a softer, more vulnerable look, choose a high viewpoint and photograph from above.

Additionally, set your key light carefully. Ideally, you'll want to use continuous lighting, but you can achieve the look with studio flash. Always light from above and aim the key light either straight down the nose or just off to one side so that the nose shadow touches the cheek shadow to create a 'Hollywood triangle'. Use the barn doors to control any spill.

Add a backlight or kicker to make the image three-dimensional and to help separate the foreground from the background. Use a reflector in the spill from the key light to control the contrast in the scene, then light the background as required.

A touch of movie glamour is timeless – just add props



© DAMIEN LOVEGROVE



## Tricks of the trade

Jason Alden

[www.jasonalden.com](http://www.jasonalden.com)

I often find myself photographing business people and those who aren't experienced at being in front of the camera, let alone going near make-up. However, the last thing I want to do is spend hours retouching a shiny bald head when I get home.

A friend of mine who is a make-up artist told me about oil-absorbing sheets, which instantly remove excess oil from the skin. Available from Boots, I now make sure I always have them in my bag. I generally offer the pack to my subject. The sheets contain a small amount of powder to help reduce the shine, but the subject doesn't know this so it won't make them feel awkward.

© JASON ALDEN



## Key lighting terms

Jamie Harrison

[www.jamieharrison.net](http://www.jamieharrison.net)

### Key light

A key light is the main light in your set-up and provides the majority of the image's illumination. Place it in front of the model.

### Fill light

The fill light is the secondary light source, which opens up any underexposed or darker areas. This could be local fill, such as clothing or the face, or the complete subject. Fill lighting can be produced by a second light or using a reflector.

### Kick light

The kick light, or kicker, is typically placed to the side of the model in order to provide a strip of illumination down the side of the body. These lights can be used on just one side or you could double up and have one on each side.

### Rim light

A rim light is similar to a kick light, but is placed more directly behind the model in order to provide a rim of highlight, especially in the hair, often with a snoot placed over the strobe. Currently, this is seen as a little old-fashioned – but trends change.



Lighting has its own fads, but first master the essentials and work from there

© JAMIE HARRISON



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## Japanese refinement

### Introducing the new fit + slim range from Marumi

The new Fit + Slim range of filters from Marumi boast a lightweight, ultra-thin frame that still enables the user to attach a lens cap securely, thanks to the newly developed high-pressure press method.

Manufactured in Japan, the Fit + Slim range is available as a Lens Protect filter, Circular PL filter and UV filter. These Eco-friendly filters are made of lead free materials with multi coating glass and satin finished frames for ultra low reflection.

For further technical information please visit [www.kenro.co.uk](http://www.kenro.co.uk)



# MARUMI

# Close-ups

Clever lighting and simple tricks make for great images, say these professionals



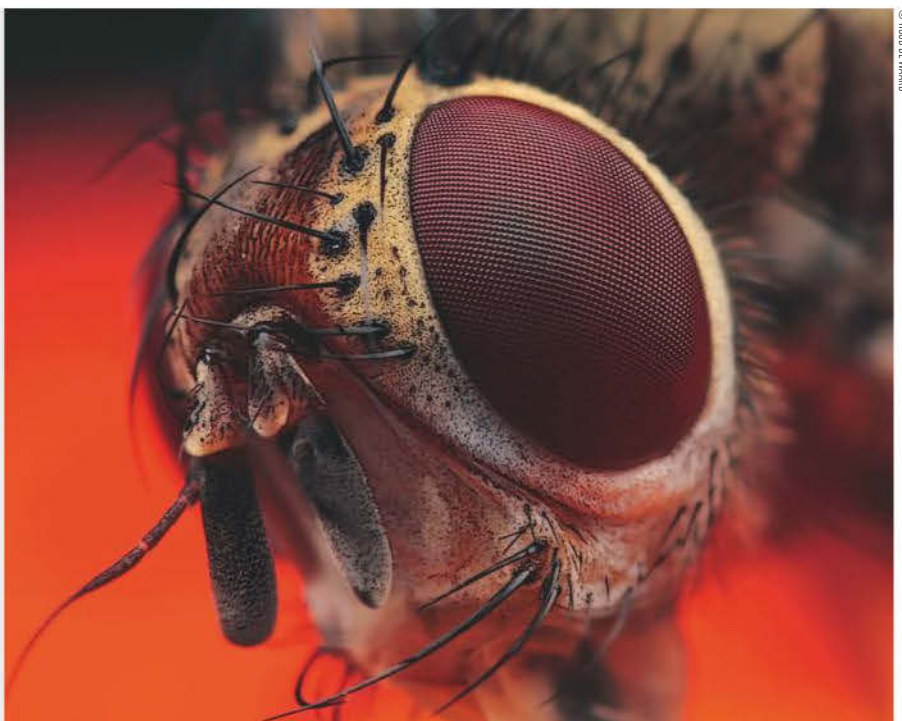
© MICHAEL BACH



**Composition**  
Huub de Waard  
[www.huubdewaardmacros.com](http://www.huubdewaardmacros.com)

Composition is more difficult for microphotography than for any other type of nature photography, as you want to simplify your image as much as you can. Luckily, the point of focus appears more pronounced in the viewfinder when the subject is under high magnification. The subject's eye(s) should be the location of sharpest focus and should have a well-chosen position within your composition.

For maximum sharpness throughout, adjust the angle of your camera so that the plane of sharpest focus aligns with the head of your subject. In microphotography, the background is often so out of focus that it appears as a solid, or smoothly varying patch, of colour. Choose a background that complements the colour and tone of your foreground subject.



© HUIB DE WAARD



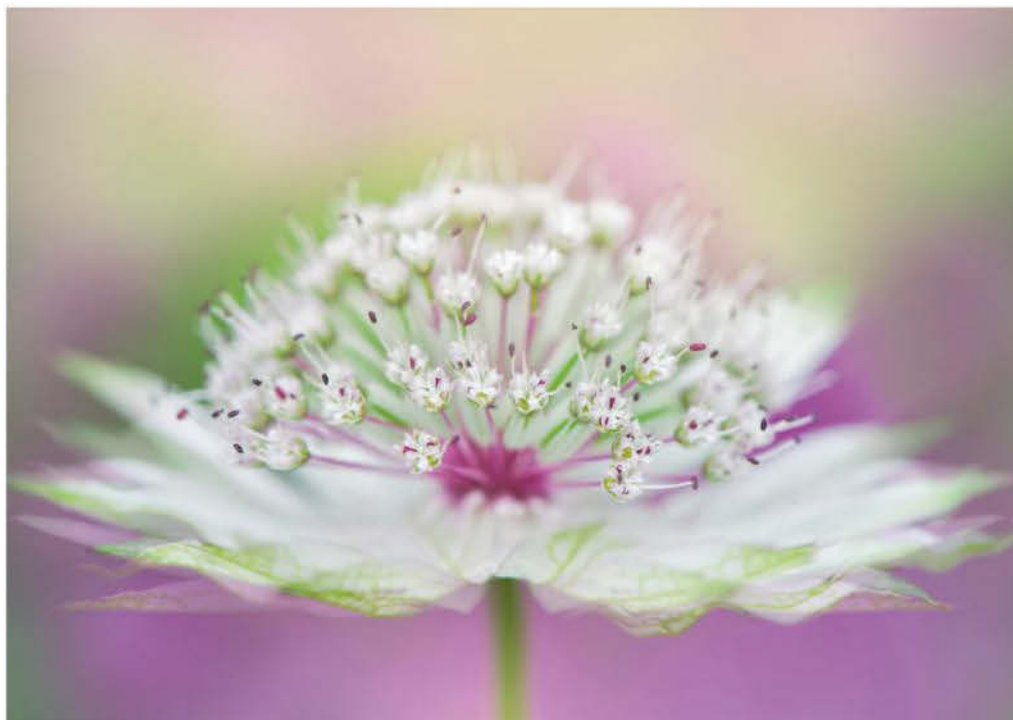
## Create your own environments



**Nadav Bagim**  
[www.aimishboy.com](http://www.aimishboy.com)

You can build your own sets on nothing more elaborate than a kitchen table. A set-up usually takes an hour or two, depending on how complex it is. I use simple household objects or other items you find lying around. The ground in my sets is made of natural ingredients like vegetables, flowers, leaves, tree bark and moss, which I arrange depending on what I'm trying to achieve.

The vibrant backgrounds are achieved using mundane but colourful items, such as supermarket bags. I like to take advantage of the shallow depth of field in macro photography to transform them into richly hued, dreamy backdrops, while the particles in the air are simply created by spraying water droplets.



© JACKY PARKER



**Style**  
**Jacky Parker**  
[www.jackyparker.com](http://www.jackyparker.com)

I aim to isolate the subject to create an elegant visual impact of shape and colour. I rarely use a tripod as many of the pictures I take are from ground level, so I end up spending a lot of time lying in the dirt! I also find that this allows me to get the angle I want.

As there is rarely the 'perfect' light for floral photography, I have found my 8in reflector to be incredibly useful. I use it not only as a reflector, but also as a clamp to hold the reflector between the

subject and the sunshine, to soften the light and reduce shading. I enjoy the warmth of the evening light, particularly when the subject is backlit.

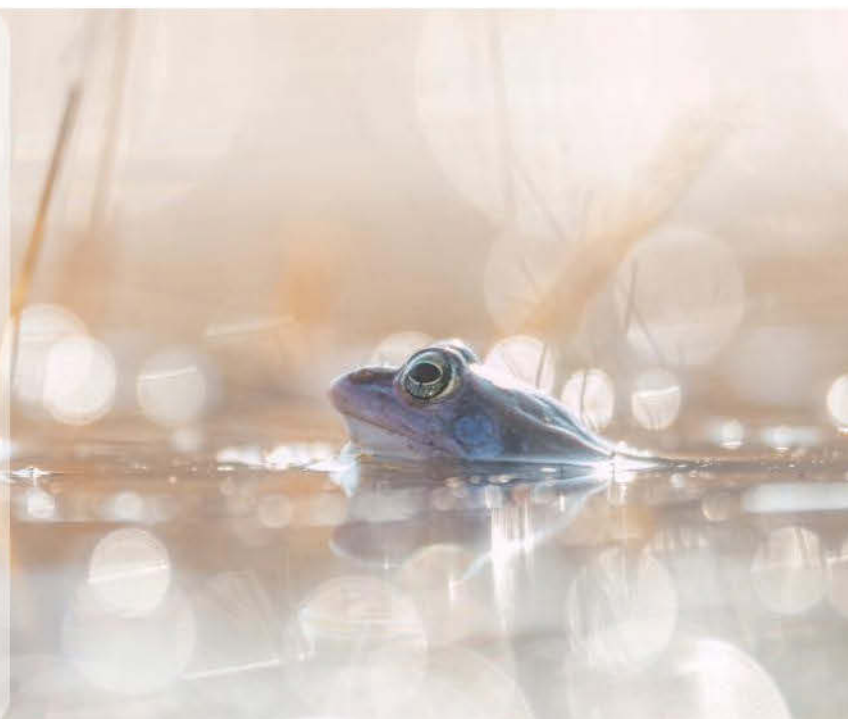
When shooting outdoors, I like to take my pictures at f/2.8 or wider, to minimise the depth of field. One of the advantages of shooting wide open is that the detail in the background is lost. I also try to shoot through other flora to create foreground colour, and have found this to be useful when photographing autumn colours.



**Quality of light**  
**Johannes Klapwijk**  
[www.johannesklapwijk.com](http://www.johannesklapwijk.com)

The quality of light and the resulting colours can make or break a close-up image, and I find backlighting works very well. Vegetation and grasses in particular can look amazing with backlighting, as it creates beautiful highlights and rims around anything transparent in the frame.

When backlighting is combined with dewdrops or other forms of water, the bokeh can be a perfect way to capture a certain mood. This is especially true with the first light of day, as the large, soft bokeh bubbles convey the warm feeling of a beautiful summer morning. However, it's also important to keep experimenting with light and weather. For example, a grey, overcast sky can give beautiful high-key shots and the bokeh from harsh midday sunlight can give a sparkling, colourful result that sometimes looks like an aquarelle painting. That's truly writing with light!



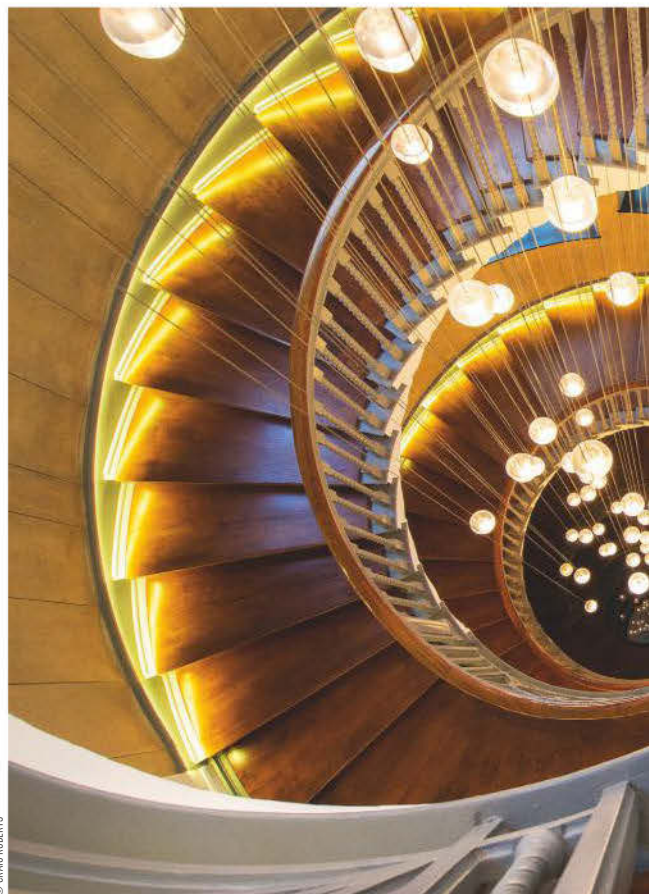
© JOHANNES KLAPWIJK

Inside tall buildings, climb as many stairs as you can and you're likely to find the optimum angle

# Architecture

How to approach and use the light in your structural shots

© ERIC FOREY



© CRAIG ROBERTS



**Get high**  
Eric Forey  
[www.kalaphoto.fr](http://www.kalaphoto.fr)

Identify places or buildings that offer you a high point of view. Climb all the staircases you come across and don't hesitate, access permitting, to get as far as you can into tall buildings. High ground and bridges can serve you well, too. Make the most of the downward view as it can offer unusual and graphic effects. Such elevated views enable you to make the most of some basic elements of architecture, such as this staircase in a public car park (above left). You can use a telephoto or a wideangle lens. The telephoto enables you to isolate the subject and find minimalist or abstract effects. Meanwhile, the wideangle lens enables you to get spectacular effects simply by amplifying the perspectives.



**Bad weather**  
Billy Currie  
[www.billycurriephotography.co.uk](http://www.billycurriephotography.co.uk)

For me, architecture is the most rewarding of all photography genres. Unlike others, it's not as reliant on weather, flattering light or time of day. The building or structure is 100% of the image; it needs neither foreground nor colour in the sky.

Make a good exposure with optimal settings and the camera's job is complete; light, shadow and mood can be taken care of later. I can't recall going out on an architectural shoot that didn't produce at least several usable pictures.



© BILLY CURRIE





Tungsten lighting can cause distorted hues, but allowing a little colour shift brings rewards



## Make sure lines are straight

Joel Tjintjelaar

[www.bwvision.com](http://www.bwvision.com)

There are a few ways to approach architecture. You can shoot straight up to the sky and emphasise the dramatic converging lines with the clouds as a backdrop. This approach is far more suitable for modern architectural photography, especially in combination with long exposures, where the streaks of clouds can create a nice visual tension while also forming a subtle background. Since there's no horizon line in your frame you can come up with any kind of composition from any kind of vantage point, without having to maintain straight verticals and horizontals.

Another more difficult approach, mostly used by commercial photographers, is to shoot straight forward, as if shooting a landscape, making sure you always have straight verticals and horizontals. It's more difficult, because if you want to capture the whole building you'll usually need a wideangle lens, but you can't stand too far from the building as then it will look too small. If you are too close you'll have to tilt your camera to capture the whole building, which will ruin the straight lines. And then there's the surrounding environment that's often hard to avoid. The solution is to use a tilt-and-shift lens so you can shift the lens upwards to maintain the straight lines while still keeping the entire building in your frame.



## White balance

Craig Roberts

[www.craigrobertsphotography.co.uk](http://www.craigrobertsphotography.co.uk)

Tungsten bulbs are bright enough to illuminate the interior for your eyes, but less effective for your camera. They also cause odd colour shifts that, again, only your camera records, as your brain can neutralise this to a white light. Thankfully, digital cameras have a built-in correcting system and this is where the white balance feature comes in.

You can tailor the white balance to suit the light source, and tungsten is one of the preset choices available. This usually corrects the colour cast but sometimes it can be nice to have a slight glow of colour shift. This can be tailored in-camera if you're shooting JPEGs by using the white-balance control. An easier way is to shoot in Raw and adjust on the computer. You can then dial in your chosen white balance to suit the picture.

Correcting it entirely can leave the image looking cold and sterile, so tweaking the white balance to allow some of the warmth of the tungsten lighting is the best option.

Being a box, La Grande Arche de la Défense in Paris is an architectural photographer's dream



© JOEL TJINTJELAAR



# Street life

Two professional photographers offer their expert advice and tricks of the trade to help you shoot your best-ever street photography images

Professional wedding photographer Kevin Mullins is passionate about street photography, using it to educate and train himself for the style of award-winning wedding photography he shoots.

When it comes to good street photography Kevin is always on the lookout for a few key elements. 'When I'm out shooting on the street, I'm always looking for good light, somewhere with a good composition, while the moment is always critical,' says Kevin.

In essence, if you can combine good light, good composition and capture a candid moment in time, Kevin reckons, 'If you can get all of those into one shot, then you've got an award-winning picture.'

Location is also important when trying to maintain spontaneity in street shots, especially when trying

to compose a shot successfully at the same time. Kevin is also a firm believer that we're observers rather than just camera operators, so likes to spend time getting to know an area where he intends to shoot. 'I may spend most of my time throughout the day looking for a street corner where the characters are likely to turn up at a certain time of the day, and then it's a case of waiting,' he says. 'Setting up a stage for the characters and the people to walk into is important. The light, background and composition comes together that way.'

## Set yourself a challenge

For those new to street photography and seeking advice, Kevin's advice is simple – set yourself a challenge. 'Don't just go out with your camera and shoot all day because you'll just



### KEVIN MULLINS

Kevin is an award-winning documentary wedding photographer based in the west of England (though a proud Welshman). Kevin was one of the first official Fujifilm X-Photographers and one of the first ever wedding photographers to embrace the Fujifilm X-Series professionally. Visit: [www.fl6.click](http://www.fl6.click) and [www.kevinmullins-photography.co.uk](http://www.kevinmullins-photography.co.uk)

come back with a load of snapshots, so instead set yourself a challenge,' he says. This may be something as simple as the colour red for instance, or it could be human interaction, or motion, but as Kevin says, 'If you give yourself an objective, you'll shoot less but get more keepers; otherwise you'll go out all day and are unlikely to return with anything worthwhile.'

When it comes to lens choice, Kevin's preferred lens for street photography is the FUJINON XF35mm f/1.4 R, and it's easy to see why. 'It's a lightweight lens, quick to focus and with a good depth of field,' explains Kevin, adding that the equivalent 50mm coverage in full-frame terms 'is very relevant to the field-of-view that we see with naturally. It's a great lens to just go out on the street with'.

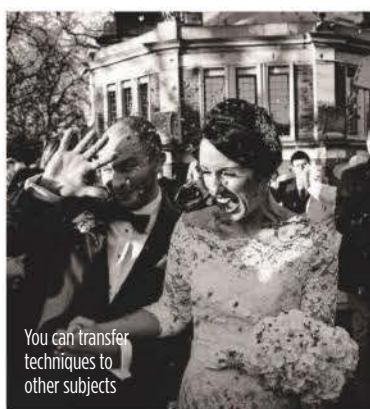
As to the choice of whether to shoot with the intention of outputting in colour or black and white, Kevin

For further information, and special offers and competitions visit [www.amateurphoto](http://www.amateurphoto)





Challenge yourself when shooting, setting yourself objectives such as to shoot something red



You can transfer techniques to other subjects

feels that this is a very subjective discussion; but while it depends on the location and subject, for him colour is his medium of choice for street photography. 'My commercial wedding photography is more emotion driven, so tends to be more mono, but when it actually comes to shooting on the street, I prefer colour.'

ographer.co.uk/fujifilm-x



Shooting from the hip can deliver great results

With a passion for street photography, Matt likes to keep the system and process as simple as possible so as not to overcomplicate the task, while constantly challenging his own ideas and concepts.

Knowing where to shoot is incredibly important for successful street shots, and Matt likes to find somewhere busy with plenty of interesting people moving around. If you're stuck for inspiration though, Matt has three favourite spots in the UK for street photography. 'Liverpool', says Matt, 'just because I know it really, really well. Manchester is also fantastic, and London. You can't go wrong in London – there are so many people and so much vibrancy in London, it's great.'

One of the difficulties faced by those new to street photography is blending in, but this all comes down to the environment. Matt's advice is to 'try to walk round a new location first without a camera and try to see how people react to you, and whether they notice you or not'. Once you've done that and have your camera with you, Matt says you should 'get back out on the street and use a combination of shooting from the hip and the camera raised to your eye, but it all depends on the area you're going to be working in'.

## Kit choice

Matt's tried quite a few lenses in the Fujifilm X-Series range, but the FUJINON XF27mm f/2.8 is his favourite on the street. Before that it was the FUJINON XF35mm



### MATT HART

Matt is a black and white street and event photographer based in Liverpool and is an official Fujifilm X-Photographer. Passionate about street photography, he has developed the skill to observe and be virtually invisible, letting the world carry on around him without affecting the scene. Visit: [www.fujiholics.com](http://www.fujiholics.com) and [www.matthewhartphotography.com](http://www.matthewhartphotography.com)

f/1.4 R but as Matt reveals, 'I've found over the past three years that the 27mm fits my needs perfectly.'

With the FUJINON XF27mm f/2.8, Matt likes to pair it with the FUJIFILM X-T10, and with the addition of an XF35mm and a few spare batteries, that's about the extent of his street photography kit. As Matt says, 'That does me; I like to travel as light as possible and to travel around and get between people, making sure that I don't stand out with bags and everything.'

Finally, what's the essence of street photography? For Matt, that's to 'try to create something different and fantastic'. Elaborating further, Matt believes that: 'Everything's been done these days, that's probably why I'm in the middle of a project at the moment shooting windows –

because everyone says windows have been done to death, but by doing a project that focuses in on that area, then I hope to look inside myself and find something a lot more interesting.'



High-end DSLR spec with a user-friendly interface

## Canon EOS 70D

WWW.CANON.CO.UK

When the Canon EOS 10D was released in 2003, some reviewers called it 'a baby EOS-1D'. This 6.3MP DSLR offered the build quality of its pricier stablemates with a 7-point AF system, 1.8in LCD monitor, and an ISO range that could be expanded to 3,200. Ten years (and various incarnations) later, Canon added to its double-digit series with the EOS 70D, which offered 20.2MP, a 19-point AF system, 3in LCD monitor, and an ISO range that could be expanded to 25,600. The enthusiast market was growing rapidly, and camera manufacturers had found themselves responding to a consumer who desired the spec of a high-end DSLR with the user-friendly interface of an entry-level model.

The EOS 70D has a number of headline features, but the most significant comes in the form of a Dual Pixel CMOS AF sensor. Unlike previous APS-C sensors, each pixel features two photo diodes, ensuring fast smooth autofocus during live view and video shooting. To make the most of this technology, the EOS 70D employs a DIGIC 5+ image processor, which delivers clear, bright 14-bit images with accurate colour, and plenty of detail. This combination also helps the EOS 70D to achieve a standard ISO range of 100-12,800, and continuous shooting of up to 7fps. Unlike its predecessor (the EOS 60D) this covetable DSLR offers a touchscreen LCD monitor



The vari-angle screen is responsive to the lightest of touches

The Canon EOS 70D was released on the 2nd July 2013



The mode dial features a lock to prevent accidental changes

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(matching the user-friendly spirit of the EOS 700D).

Naturally there were criticisms. Some reviewers found the Auto White Balance a touch too neutral, and the

metering temperamental in high-contrast scenes, but in general the camera was well received. Those looking to upgrade from an entry-level EOS model (such as the 650D) will find their needs well catered for by the EOS 70D, but those looking for a camera that offers a super-fast frame rate will want to look at the more advanced 7D Mark II.

**In the range** How the Canon EOS 70D fitted in the range



EOS 700D



EOS 70D



EOS 7D Mark II

## KEY SPECS

**SENSOR** 20.2MP CMOS  
**ISO** 100-12,800 (can be expanded to 25,600)  
**BURST MODE** Up to 7fps  
**MOVIE** Full HD 1920 x 1080  
**DISPLAY** 3in, 1,040k-dot TFT vari-angle LCD  
**DIMENSIONS** 139 x 104 x 79mm  
**WEIGHT** 755g

## What our test said

'There's no denying that the autofocus performance during live view is a massive step up from what we've seen on previous DSLRs, but it's not quite on a par with the best system cameras. The good news is that it's now a pleasurable user experience that can be relied upon, rather than a clunky mode that's only used out of necessity.'

'The results from the new sensor don't disappoint either, and while it doesn't quite match the headline-grabbing resolution of the Nikon D7100, it's still very good. The 70D is an impressive piece of kit that does so many things well, while the Dual Pixel AF sensor will no doubt revolutionise the way AF performs on a DSLR. For enthusiast photographers, it's one of the most complete DSLRs available.'

### PROS

- Sensor delivers excellent AF performance in live view
- Impressive 19-point AF system

### CONS

- AWB too neutral
- Creative filters JPEG only
- Metering slightly off in high-contrast scenes

Camera GOLD

## How it stacks up today

Rumours of a Canon EOS 80D have been circulating for months now, with gossip suggesting NFC (Near Field Communication), an upgraded processor, improved frame rate and boosted ISO range among the 'improvements' over the 70D. The pixel count, however, is unlikely to change, and the 19-point AF system is more than adequate, so these elements may well stay the same.

## Alternatives

With a 24MP sensor, no low-pass filter, 51-point AF system, and a 3in fixed LCD monitor the Nikon D7100 is clearly aimed at the enthusiast market. The Pentax K-3 has the same target market in its sights and, as such, offers a 24MP sensor, 27-point AF system, and a 3.2in LCD monitor.





# The Canon EOS 70D Three users give their verdicts

## Alan Hopps

CO ARMAGH

I started taking pictures after my wife bought me a film camera for Christmas some 20 years ago. I progressed into point-and-shoot digitals, then to a Panasonic bridge camera (FZ 18). Finally, I bought a Canon 1000D, which was my first DSLR. From that, I moved on to a 60D and now a 70D.

Having started on the crop-sensor route and bought the appropriate lenses to go with the cameras, that is where I have chosen to stay. My full-time job is in the Department of Agriculture, thus landscapes and farm animals are my favourite subjects, particularly during early-morning sunrises, which give the best light.

The 70D particularly attracted me because of the swivel screen and fast focus. It was the obvious progression from the 60D. I tend to use the 70D in Aperture Priority mode most of the time with a Sigma 17-70mm f/2.8 zoom lens attached. I love this lens for its versatility. If it's a 'big sky' day, then the Canon 10-22mm goes on the camera. Occasionally, I will use the Canon 70-200mm f/4 IS lens for animal portraits.

The 70D is light and portable. The swivel screen is invaluable for low-angle shooting or 'above-the-head' shots. The only annoying thing about the 70D is that it is very easy to knock into video mode by mistake. If anything was to change on the 70D, I would like a full-frame sensor while keeping the same features.

**Permajet says:** 'Alan's atmospheric shots would look great on the PermaJet Smooth Fine Art paper range, which has subtle base colours that would bring his photos to life and enhance the sense of depth and clarity.'



[WWW.FLICKR.COM/PHOTOS/ALANHOPPS](http://WWW.FLICKR.COM/PHOTOS/ALANHOPPS)



### 1 Chilly morning

This picture was taken on a large local dairy farm. I like to show how healthy and well looked after the cows are on our farms here in Northern Ireland. 17-70mm, 1/1000sec @ f/5, ISO 1000

### 2 Silence of the lambs

This was taken at the local livestock market from an overhead gantry under sodium lights. A different angle than usual for a livestock shot. 17-70mm, 1/64sec @ f/4, ISO 800

### 3 Mist on the Callan

An early start on a cold October morning for this shot near Tassagh Viaduct on the Callan River. I was hoping for better light but still quite liked this shot. 10-22mm, 1/13sec @ f/16, ISO 100



# Jason Dale

SHROPSHIRE

My first SLR was a Zenith 11 film camera (1983). I studied photography at school, acquiring a GCSE O-level in photography.

Live concert photography is a favourite genre of mine – I go to live gigs once a month and there is also a great open mike scene locally. It's nice to combine my two passions, live music and photography.

More recently I have gravitated towards natural history photography. I quickly identified that my Canon EOS 40D was not really adequate (low pixel count/noisy images). This was around the time the 7D Mk II was launched. Due to the price difference between that and the 70D, I decided the 70D was good enough for my needs, and it has proven to be a very capable camera in the field.

I use Aperture Priority most of the time. My lenses are f/2.8 L lenses with the exception of my two telephotos, so I like to have full control of the DOF. When combined with the EF 500mm f/4 IS, the tracking and autofocus on the 70D are particularly good for birds in flight and moving subjects – much better than any of my previous EOS cameras.

It's nice having Wi-fi for sharing work in the field, but not a deal breaker. The swivel screen on the rear is a nice touch, too. Noise is also fairly good on the 70D at ISO 1600 and 3200, but I still try not to go that high if I can avoid it.

In 2015, you'd expect GPS and Wi-fi as standard on high-end prosumer and professional models, so I hope when the next versions hit the street, Canon will include both as standard.

**Permajet says:** 'PermaJet FB Matt paper, which has an advanced matt coating and velvet soft appearance, would be an excellent choice for Jason.'



WWW.JASONDALE.COM



## 1 Great tit

Taken on Cannock Chase, Staffordshire, in the low afternoon light.  
500mm f/4L, 1/2500sec @ f/5.6, ISO 800

## 2 Jay

Another one from Cannock Chase, which is one of my favourite places for pictures.  
500mm f/4L, 1/800sec @ f/4, ISO 1000



## 3 Leaping salmon

Taken on the River Severn during the annual migration of salmon upstream to Wales.  
70-200mm f/2.8L, 1/1250sec @ f/5.6, ISO 1600





# Andy McDonald

ABERDEENSHIRE,  
SCOTLAND

My interest in photography started in 2005 while on geology field trips as part of my university studies. At the time I used a Canon PowerShot A95, which was a great little camera.

As my interest grew, I moved on to my first DSLR in 2007 – the Canon 400D. It was only in the last two years that my interest developed further and I started thinking about composition, and how aperture and shutter speeds related.

My main focus is on landscapes, which ranges from coastal shots to night time-photographs of the aurora. I do like to dabble in other areas occasionally, such as wildlife and macro. Most of the time I shoot in manual or Av mode, depending on the subject.

In 2014 I upgraded to the 70D as I wanted to take advantage of a newer model with newer features and capabilities such as the higher ISO, live view and improved focusing system.

What I liked about the old PowerShot A95, and now the 70D, was the tiltable screen, which I missed on the 400D. I find it's great for getting shots that are low to the ground or in awkward places where you can't easily use the viewfinder.

The 70D is larger and bulkier than the 400D, which is something that I expected when I upgraded, but it's not a big issue for me. Overall I think the 70D is a great camera and it suits my current needs with room to progress.

**PermaJet says:** 'Andy's stunning landscapes would be best suited to PermaJet's award-winning FB Distinction, with the highest D-max rating in the world, a heavy base and a gloss finish to achieve a superior result.'



WWW.FACEBOOK.COM/ANDYMCDONALDPHOTOGRAPHY



## 1 The Fairy Pools, Skye

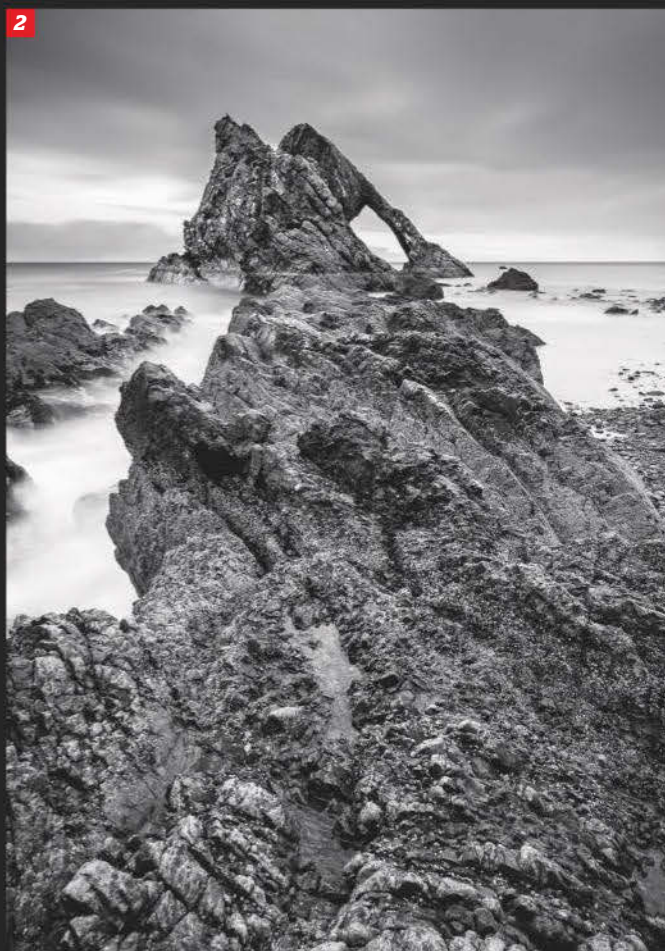
Even on a cloudy day, the Isle of Skye is truly beautiful.

EF-S 10-18mm f/4.5-5.6 IS STM at 11mm, 2.5 seconds @ f/13, ISO 100, Hoya ND six-stop filter, tripod

## 2 Bow Fiddle Rock, Moray

An impressive arch that has formed over millions of years.

EF-S 10-18mm f/4.5-5.6 IS STM at 13mm, 25 seconds @ f/9, ISO 100, Hoya ND six-stop filter, two-stop ND grad, tripod



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# In need of another lens and a decent monitor for editing

WANDLE

**Q** I have two questions. First, I have a Canon EOS 1100D with an 18-55mm kit lens and the 50mm f/1.8. What would be a good next lens to get for everyday shooting – portraits, street photography, and the like? I'm thinking a pancake lens such as a 24mm or 35mm? Secondly, I edit my photos on my (fairly basic) laptop and worry that the colours, etc I see aren't true to life. What sort of things should I be looking at in terms of a (not too expensive) screen? Do I need to worry about the quality of my graphics card?

**A** For classic head and shoulders portraiture, you already have a very good lens in the 50mm f/1.8. A 24mm focal length would be good for street photography and you do of course have that capability in your 18-55mm kit zoom. So why not consider the Canon 24mm

f/2.8 STM? Yes, it's a pancake lens and so it makes your camera less bulky, but the biggest reason is its bright f/2.8 aperture and good optical performance, both of which distinguish it from your 18-55mm kit zoom.

Typical low-cost laptops make do with relatively poor quality LCD screens. They may be limited in resolution and exhibit a small colour gamut. Even more noticeable will probably be a noticeable limitation in viewing angle. You may see that unless your head is optimally positioned you will see a dramatic fall-off in brightness towards the edge of the screen. You can do

yourself a big favour to ensure the colours displayed are as accurate as possible and the brightness conforms to industry standards so colour and brightness will conform with what you want others to see. To do this you should invest in a screen calibrator and these start at around £67 for something like an X-Rite ColorMunki Smile. Of course a good quality external monitor would be great to have and the recommended type would be an IPS-panel display, which offers excellent viewing angles and you can get 23in or 24in examples now for around £150 – but you will still need a calibrator! **IB**

A screen calibrator like the ColorMunki will ensure accurate colours in your images



## Which new lens to cure my soft photos?

PHILIP BROWN 77

**Q** I have a Canon EOS 600D, with Canon EF-S 18-200mm f/3.5-5.6 IS and Canon EF-S 18-55mm lenses. I haven't really used the 18-55mm because I prefer the other lens. My primary uses are to take photos of my two children – a baby and toddler, who both don't sit still, ever. I also like to take wildlife photographs – particularly at zoos and wild animal parks – and garden birds. I prefer to handhold rather than use a tripod. My issue is that my pictures seem to be a little soft and not as sharp as they used to be. As a result, I'm looking to upgrade. Do you have suggestions or recommendations?

**A** Your EF-S 18-200mm is a very versatile lens and not a bad example of this kind of wide focal length range superzoom. However, there is no getting away from the fact that with only a few exceptions, these lenses are optical compromises. The EF-S 18-200mm, for example, is rather soft at the wideangle end of the zoom range and you may have noticed quite a bit of geometric distortion as well as purple fringing of high-contrast edge details. To freeze action effectively, you need as much light as

possible so a faster (brighter) lens could be the solution. Replacing your standard kit zoom with, for example, a Sigma 17-50mm f/2.8 OS HSM would definitely help, or you could go for an even faster wideangle prime depending on your budget. For telephoto work, you should aim for a

longer zoom, with optical image stabilisation, but with a shorter multiple zoom factor range. Around 70-300mm is the classic range and there are a number to consider, like Tamron's 70-300mm f/4-5.6 Di VC USD. **IB**



For telephoto shots, consider the Tamron 70-300mm, which has image stabilisation

## Fujifilm X-T10 vs Olympus OM-D E-M10

HORIZON

**Q** Can you tell me which Compact System Camera is better, the Fujifilm X-T10 or the Olympus OM-D E-M10, in terms of image sharpness and low-light performance? Moreover, which one do you think is going to keep at least 60% of its current value in three years' time?

**A** You don't say whether you mean to compare the Fuji X-T10 with the original Olympus OM-D E-M10 or its recently launched replacement, the E-M10 II, although there isn't a major difference in absolute image quality between the old and new models. In absolute terms, the X-T10's larger APS-C X-Trans sensor does produce better high ISO performance than the Olympus E-M10s, although it may not be that great a difference in practice. There are more bright Micro Four Thirds lenses available for Olympus (and Panasonic) bodies and if you use these then the low-light advantage of the X-T10 can be outweighed. In terms of sharpness this rather depends on the lens used. Neither camera is likely to retain 60% of its value after three years. **IB**





# Should I upgrade my DSLR?

MATHEW JKNOTT

**Q** I have a Nikon D3200 which I find limiting in terms of what I want to get out of it. I mainly enjoy wildlife and nature photography but am happy with most genres.

One of the limitations with my D3200 is when using the flash. It has a maximum shutter speed of 1/200sec when the flash is used and takes what feels like a lifetime to recharge the flash. Owing to this, many photos taken when I've used flash turn out to have the birds' wings blurred where the shutter speed is not fast enough.

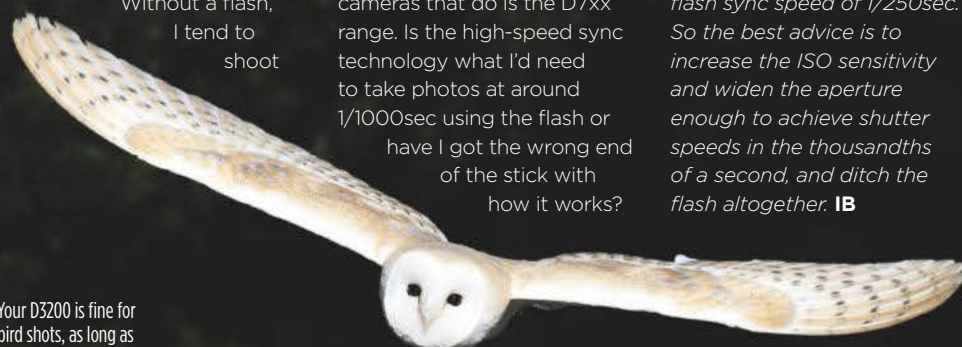
Without a flash, I tend to shoot

birds at around 1/1000sec. I did consider getting a flash to attach to the hotshoe but have since read that it would still be limited to around 1/200sec and for anything faster I would need a camera that supports high-speed sync, something that mine does not.

So I have been looking into potential upgrades, D5xx range or D7xx range. Price is a big factor as I'm currently unemployed, so I was considering one of the D5xx range, possibly the D5500 or D5300. I'm not sure though if they support high-speed sync or if the only Nikon DX cameras that do is the D7xx range. Is the high-speed sync technology what I'd need to take photos at around 1/1000sec using the flash or have I got the wrong end of the stick with how it works?

**A** Some wild bird photographers do use flash but this technique is quite specialised. Normally the strategy is to crank up the camera's shutter speed in order to freeze the action in ambient available light. Even if you decided to use flash, while the sync speed of 1/200sec may seem a limitation, you need to remember that the flash duration will be much shorter than the mechanical shutter of your D3200. Upgrading your camera won't make much difference because, for example, the D7200 has a flash sync speed of 1/250sec. So the best advice is to increase the ISO sensitivity and widen the aperture enough to achieve shutter speeds in the thousandths of a second, and ditch the flash altogether. **IB**

Your D3200 is fine for bird shots, as long as you alter the settings



# Lens advice for wedding photos

RHYS FOX

**Q** I'm after a good lens for my aunt's wedding. I'm not the sole photographer but I'd still like to get great pictures. I'm looking at the Sigma 17-50mm f/2.8 OS lens. The Nikon version is a bit out of my price range. I understand

that the 1.5x crop factor makes it equivalent to 25.5-75mm. However, does the crop factor affect the f/2.8 aperture to make it an f/4.2 or will I still be able to use the f/2.8? I have a Nikon D3300, plus a 35mm f/1.8G and a 70-300mm f/4.5-5.6. Will this Sigma lens complement these two well? Portrait ability would obviously be preferred.

**A** There is no doubt that the Sigma 17-50mm f/2.8 EX DC HSM OS would be a handy lens to use with your Nikon D3300 at a wedding. You will also be pleased to hear that the cropping factor does not affect brightness, so f/2.8 remains f/2.8. The cropping

factor does affect depths of field, so while a 50mm focal length gives a field of view like a 75mm lens on a full-frame body, there will be greater depth of field with your D3300 and its smaller APS-C sensor. If you really want to blur the background and you have the space to separate yourself from your subject, then your 70-300 zoom at, say, 100mm will do a more effective job, even at a slower aperture of f/5.6, for example. Of course you will need adequate light and you probably wouldn't want to use flash. You already have the 35mm f/1.8, which would be handy for wider view portraits, especially portraits of couples and group photos. **IB**



The Sigma 17-50mm lens would be a great choice for a wedding

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## First DSLR on a budget

S A M T D

**Q** I'm really interested in getting my first DSLR camera, as up until now I have only used my wife's bridge camera, or a mobile phone. I'm limited by budget as I have just got married, so I'm looking at secondhand and for my budget I have seen: Nikon D3100 or D3200, Nikon D5100, Canon EOS 1100D or 1200D. I know there are other brands but I've just been researching these at the moment, so any advice on these cameras and which you would recommend would be gratefully received. I plan on mainly doing nature photography and general sightseeing photography.

**A** Of the cameras you have listed, the Nikon D5100 boasts the most features combined with very good image quality. Canon's entry-level models are out-gunned by Nikon's and while the D5100 is not the cheapest option here, it does have aces like a fully articulating screen and one of the best in class AF systems. You could also consider a Pentax K-r and if you intend to do a lot of travelling, especially on low-cost airlines with limited carry-on baggage allowances, a compact mirrorless system camera could be a wise alternative choice. **IB**



## Which lens for portraits?

M A T H E W J K N O T T

**Q** My girlfriend is into portrait photography but as yet does not have a prime lens; all she has is an 18-55mm and a 70-300mm lens. As her birthday present, I'm considering getting her a new prime lens, but I'm not fully sure which one would be best. She has a Nikon D3300 camera so I was thinking either a 35mm, 50mm or 85mm lens. In Jessops, I think they recommended the 35mm as they said with the crop factor it would be like a 50mm (I may be wrong on that as I can't remember for sure). The 35mm I was looking at is the AF-S DX NIKKOR 35mm f/1.8G. Would that be the best lens to get for her?

**A** The 35mm f/1.8G is a great value lens but it's a little short for classic portraiture. You are correct that the 35mm lens translates to a focal length close to the equivalence of a 50mm lens on



a full-frame body. It's actually 52.5mm and a lens like this has a lot of versatility and is why it was popular as a 'standard' lens before zoom lenses improved enough to be sharp and affordable. However, a longer lens would give you portraits where you could fill the frame more without introducing distance-related distortions caused by being too close from your subject, which would be an issue with a 35mm lens on your D3300. Happily, the Nikon AF-S NIKKOR 50mm f/1.8G would be a great value choice prime for portraits. **IB**

## Canon full-frame vs APS-C

B A Z A R C H I E

**Q** Is a full-frame camera that much better than an APS-C? I have a Canon EOS 7D Mk II which is a great camera, but would a full-frame camera, for instance a Canon EOS 5D Mk II or EOS 5D Mk III, produce much better image quality?

**A** The image quality deliverable by the latest APS-C sensor cameras is remarkably good and can exceed that of some full-frame sensors from just a few years ago. On the other hand, the latest full-frame sensors have raised the bar a lot, too, especially in

terms of absolute resolution, with Canon now offering 50 megapixels via the EOS-5Ds and 5Ds r. Many would be very satisfied with the images from an EOS 7D Mk II and it should be pointed out that the fast-shooting and fast-focusing 7D II is aimed at a different audience to either the 5D Mk II or 5D Mk III, which would be more at home in a studio or shooting landscapes. But to answer your question, the 7D II sensor is still going to play second fiddle to either a 5D Mk II or 5D Mk III in absolute terms.

Would you notice a radical difference in practice? Now that's an entirely different question.

**IB**

The full-frame Canon EOS 5Ds offers impressive resolution

## Next month



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Skogafoss, Iceland.  
Winter is a magical  
time to be with your  
camera – and Iceland  
offers spectacular  
winter scenery.  
*Canon EOS 5D Mk III,  
16-35mm, 0.9ND  
filter, 8 seconds  
@ f/13, ISO 100*

# Winter wonderlands

In winter the potential for stunning images abounds. We help you make the most of the season

WORDS AND PICTURES **LEE FROST**

Winter. The season of short days and long, long nights. Of frost and snow, stormy skies, driving rain and spine-tingling cold. Most folk wish winter was over before it has even begun. But photographically, it's the season of good will, and all the things that drive mere mortals mad are the stuff of amazing images. Which is why, as the mercury starts to plummet, photographers everywhere start digging out their thermals, stocking up on batteries and preparing for a few months of fun. So bring on the cold – we're ready for it. Let

the wild winds blow – we love a good storm. As for snow – the more the better.

Taking great pictures in winter is actually no harder than in any other season, it's just that you're working on a slightly different canvas. Instead of the lush greens of summer and golden hues of autumn, the landscape is stripped to its bare bones. And okay, the weather may be less predictable, but who's complaining if you wake up to an unexpected hoar frost that coats everything in a million sparkling ice crystals, the magnificent sight of the sun's golden orb slowly rising over a frozen landscape or freshly fallen

snow that transforms everything into a winter wonderland?

Planning is the key to success in winter. Because the weather's unpredictable, you need to be prepared for whatever the elements throw at you. So make a list. Note great locations for sunrise or sunsets. Do some scouting locally and establish places where you can get shots after snowfall, if it's a crisp, frosty morning, or when a heavy fog comes down. By compiling this winter wish list you'll know exactly where to go to make the most of whatever weather conditions happen to greet you on a day-to-day basis.





Alnmouth, Northumberland. The low winter sun is ideal for bringing out the texture in freshly fallen snow. Canon EOS 1DS Mk III, 17-40mm, polariser, 1/4sec @ f/20, ISO 100

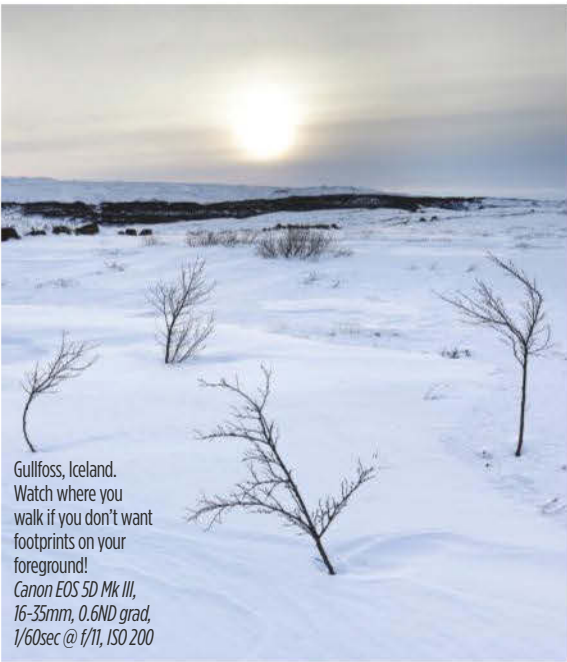
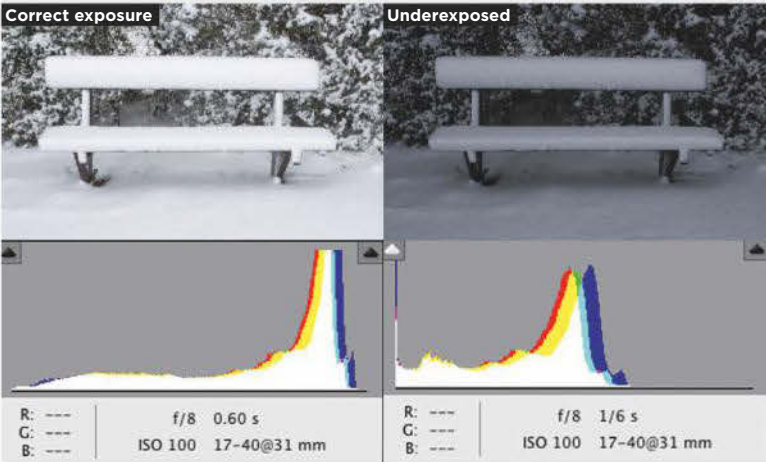
## Tip 1 Shooting snow

There's nothing like freshly fallen snow to transform the landscape into a winter wonderland. To capture snow at its best, you need to be on location as soon as possible after the fall ceases, so that it's in pristine condition. Ideally, the weather should be clear and the sun shining. Crisp snow against a deep blue sky looks wonderful, but white snow against a dull, grey sky looks far less inspiring for colour photography (though you can always convert the images to black & white later).

Early morning and late afternoon are generally the best times to shoot snow. The sun will be low in the sky so it casts long, cool shadows, which add interest to your images and also reveal texture in the snow. The warmth in the light also keeps the snow looking pure and white. Around the middle of the day, or in dull weather, there's a tendency for snow to record with a slight blue cast because the light's cooler, though this can be attractive.

## Tip 2 Exposure poser

Underexposure is common when shooting snow scenes because your camera tries to record the white snow as a grey midtone, which it does by darkening it down. To prevent this, you need to increase the exposure. The amount varies, but you don't want to overexpose the snow so take it easy. Increase the exposure in 1/3-stop increments using exposure compensation and check the histogram for each shot as well as the preview image. You'll see the histogram gradually shift to the right. Keep increasing the exposure until the histogram is as far as you can get it to the right before the brighter highlights start to overexpose. In some situations you may reach this point with 2/3-1 stop exposure compensation but in others you may need to increase the exposure by more than two stops. It doesn't matter how much you increase the exposure by, as long as the highlights don't blow.



Gullfoss, Iceland. Watch where you walk if you don't want footprints on your foreground! Canon EOS 5D Mk III, 16-35mm, 0.6ND grad, 1/60sec @ f/11, ISO 200

## Tip 3 Watch your step

If you're shooting snow scenes, tread carefully when you reach a promising location so you don't ruin the foreground with your own boot prints! It's no big deal to clone them out and in some cases, a neat line of footprints can make an effective lead-in line, but if you're not sure where to shoot from initially, it's best if you walk around the perimeter of the scene.

## Tip 4

# The quality of light

One great thing about winter is that the days are short, with the sun rising after 8am and setting by 4pm, so you don't have to get up in the middle of the night for a dawn shoot and you'll be home again by teatime. Not only that, because the sun never rises very high in the sky during winter, the light quality is high all day long, so you can shoot from dawn till dusk without a break and enjoy more good hours of photography than in the middle of summer!

Rannoch Moor, Scotland. The quality is light is high all day long in winter.  
*Canon EOS 1DS Mk III, 17-40mm, polariser, 1/4sec @ f/8, ISO 100*



## Tip 5 Using a polariser

On a sunny winter's day, it's well worth using your polarising filter. Not only will it deepen the blue sky and enhance cloud formations, but it will also improve clarity and contrast, boost colours and remove glare from ice, frost and snow. Rotate the polariser as normal until you're happy with the effect, but watch the sky – full polarisation may turn the winter sky almost black as it's naturally a deep blue already, and that will look unnatural.



## Tip 6 Misty moments

Early on a cold winter's morning you'll often find mist swirling around trees, hanging over rivers and streams like a mysterious shroud and reducing the world to pastel colours and simple, two-dimensional shapes. Mist also tends to settle in valleys, and when viewed from a high position can look very evocative, with tree tops and church spires just visible, or plumes of smoke from coal fires drifting into the air. Such scenes tend to look best after a very cold night, when the mist has frozen and stays put for much longer. If you descend into the mist you'll also find trees covered in thick frost due to the moisture in the air settling on them before freezing.



Near Vik, Iceland. Snowfall simplifies the winter landscape.  
*Canon EOS 5D Mk III, 70-300mm, 1/320sec @ f/5.6, ISO 1600*



## Tip 7 Keep it simple

Snowfall simplifies the winter landscape by obscuring details. Only big, bold features remain after heavy snow – trees, pylons, walls, telegraph poles, fence lines and buildings. Low-level features are buried from view. This provides the perfect ingredients for stark, simple landscapes. Use a telezoom lens to isolate a single feature, such as a bare tree in the middle of snowfield or a fence arching over the top of snow-covered hill, and exclude all other features so you end up with minimalist compositions. Converting the images to black & white can work really well when you're shooting scenes like this and it simplifies them even more.





Thingvallavatn lake, Iceland. You don't have to rise early to capture first light in winter.

Canon EOS 5D Mk III,  
24-70mm, 1/100sec  
@ f/8, ISO 200

## Tip 8 The early bird

Timing is crucial when shooting winter weather. Snow, frost and ice are all at their most photogenic when they're fresh and the air temperature remains low, but as soon as temperatures rise, everything begins to melt and fade away. Winter days are usually at their coldest early in the morning, so to make the most of amazing conditions, be out and about at first light. The pre-dawn light also has a magical quality, with images often taking on a moody blue hue.



Glen Etive, Scotland.  
The snow and  
ice-covered boulders  
provide perfect  
foreground interest  
in this scene.  
*Canon EOS 1DS Mk III,  
16-35mm, 0.6ND  
grad, 2 secs  
@ f/22, ISO 50*

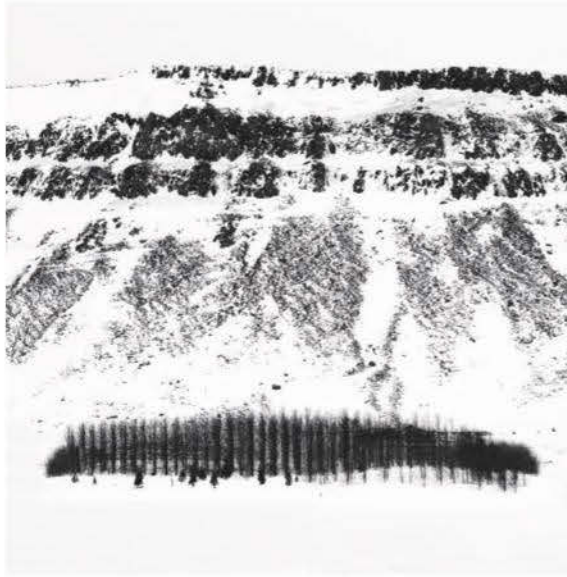
## Tip 9 Fill the foreground

Nothing beats a big, dramatic wideangle scene for capturing the drama and beauty of winter, so keep your eyes peeled for suitable candidates. Foreground interest is particularly important. Look for snow-covered boulders, footprints in the snow, patterns in ice or water flowing around frozen rocks, then get in low and close with your widest lens to exaggerate perspective. If you stop down to f/11 or f/16 you'll be able to record the whole scene in sharp focus. For added drama, turn your camera on its side and shoot in portrait format.



## Tip 10 Ice patterns

After a freezing cold night, a sheet of ice often forms over still water in lakes, lochs, ponds and puddles and offers great potential for pattern and detail images. Trapped air forms millions of tiny bubbles while the movement of water as the ice forms results in graceful curves and swirls in the ice. The repeated freeze-thaw that occurs as temperatures rise during the day also creates amazing patterns – like shattered glass – and a single stretch of riverbank or lakeshore can be the source of many different images. A macro lens is ideal for real close-ups, but a standard zoom or 50mm prime also works well. Just one obvious word of warning. People die every winter when they fall through ice into freezing water, so don't take risks for the sake of a photograph!



## Tip 11 Convert to black & white

The winter landscape is stark and barren. Snowfall covers most of the features you'd normally see, trees stand skeletal against the sky and the weather can be dark and foreboding. This combination of factors makes winter an ideal time to try your hand at black & white photography – often there will be so little colour in the scene that your images look monochromatic anyway! The key is to be bold – darken those moody skies and boost contrast to really make the most of the light/dark combination of tones so often seen in the winter landscape. Applications such as Silver Efex Pro 2 by Nik Software make black & white conversion quick, easy and amazingly effective.

## Tip 12 Take spare batteries

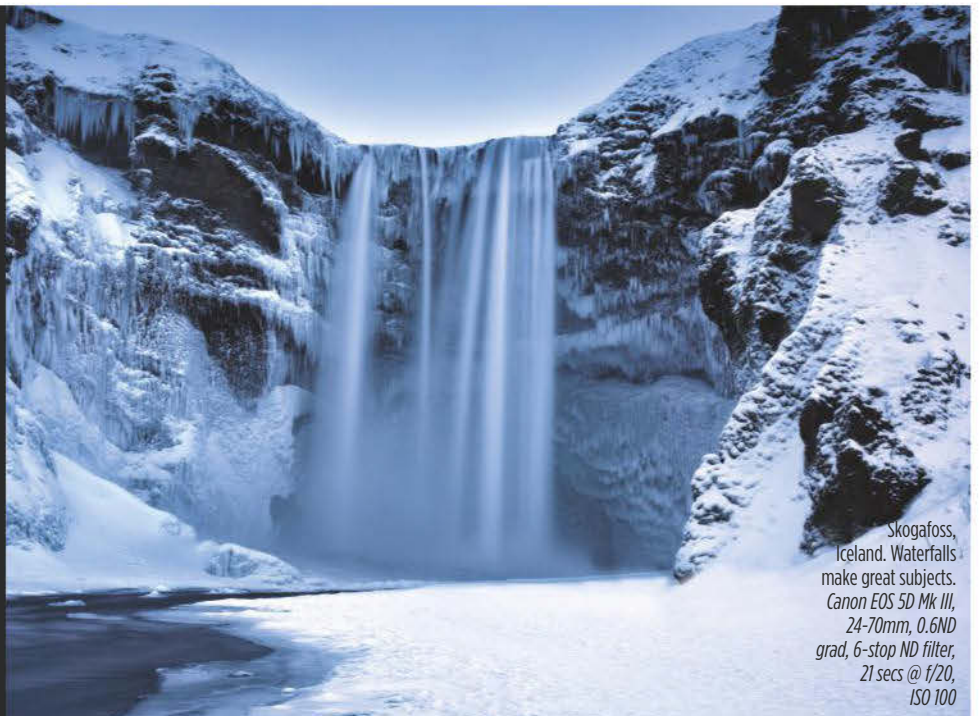
Batteries tend to drain faster in low temperatures, so to prevent your camera running out of juice just as the light's getting really good, carry a fully charged spare and keep it close to your body so it remains warm. If the battery in your camera packs up, switch to the spare and warm up the original to give it a new lease of life.

## Tip 13 Avoid condensation on your gear

If you spend a while shooting outdoors in the cold then return to your cosy home, warm air will condense on your cold cameras and lenses and form a layer of condensation – water – which can take ages to clear. In order to avoid this, put your gear in a big polythene bag with some sachets of silica gel before going indoors, seal the bag, and leave everything to reach room temperature for an hour or two. If any condensation does form it will be absorbed by the silica gel.

## Tip 14 Frozen waterfalls

It's hard to imagine temperatures getting so low in winter that moving water can actually freeze, but it does happen, and the results can look amazing! Waterfalls usually freeze over time, bit by bit. Often you'll still find some water flowing between or behind the ice, but it's not unknown for them to freeze up completely and create a wall of patterned ice or giant icicles. Where there is water flowing still, include it as a contrast with the ice and use a slow shutter speed of ½-1 second to blur its motion.



Skogafoss, Iceland. Waterfalls make great subjects.  
Canon EOS 5D Mk III,  
24-70mm, 0.6ND  
grad, 6-stop ND filter,  
21 secs @ f/20,  
ISO 100



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# The **5 best** ultra-wideangle zoom lenses

ALL SCENIC IMAGES BY MICHAEL TOPHAM



**U**ltra-wideangle lenses are an essential piece of equipment for professional architecture and interior photographers, and can also be worth their weight in gold for those landscape photographers looking to shoot a bit wider than a regular wideangle zoom will allow. Whereas most standard zooms offer a maximum wideangle setting of around 24mm, ultra-wideangle lenses go as wide as 11-16mm. Unlike fisheye lenses, which typically provide a focal length of around 10-15mm, ultra-wideangle zooms are rectilinear in design, which is to say they present vertical and horizontal lines as straight rather than curved. That is not to say that they are distortion-free, but they do capture images in a way that appears 'natural' to the human eye.

Turn over for our rundown of the **BEST 5 on the market...**

## Key points of an **ultra-wideangle zoom**

### Maximum aperture

Cheaper ultra-wideangle zooms tend to offer a maximum aperture of around f/4.5, with more expensive ones typically offering f/4 or even f/2.8.

### Front element protection

Because many ultra-wideangle zooms use a convex front element it's not uncommon for them to come with a fixed lens hood.

### Size

Because of the engineering feats required, ultra-wideangle zooms tend to be quite large and bulky, especially those designed for use with full-frame cameras.

### Third-party options

While Canon, Nikon and Sony all offer a wide range of options, it's always worth exploring what's on offer from third-party lens manufacturers.



## P66 Accessories

- Gitzo GK1555T-82TQD Traveler tripod kit
- Lowepro S&F Filter Pouch 100 • Leef iBridge iOS Micro SD Card Reader • Manfrotto 804RC2 Mark II 3-way head • Manfrotto Off Road Hiker



## P68 Camera test

Although it's aimed squarely at the enthusiast photographer, the Canon G5 X has a wealth of physical controls that should satisfy the most discerning snappers.



## P72 Lens tests

- Fujinon XF 35mm f/2 R WR
- Sigma 20mm f/1.4 DG HSM | A
- AF-S Nikkor 24-70mm f/2.8E ED VR



## 5 OLYMPUS M.ZUIKO ED 7-14MM F/2.8 PRO £1000

The Olympus M.Zuiko Digital ED 7-14mm f/2.8 PRO is a premium wideangle zoom for Micro Four Thirds (MFT) cameras. For those looking to maintain a fast f/2.8 maximum aperture for all their lenses, the Olympus 7-14mm can be paired with the Olympus 12-40mm f/2.8 and 40-150mm f/2.8 to cover the 35mm equivalent of 14-300mm. Its main rivals are the highly regarded Panasonic Lumix G Vario 7-14mm f/4 ASPH, which is around £750, and the diminutive Olympus M. Zuiko Digital ED 9-18mm f/4-5.6, for around £360.

Equivalent to 14-28mm on a full-frame camera, the Olympus 7-14mm has 14 elements in 11 groups. This includes two aspheric extra-low dispersion ED glass elements and a dual-sided aspheric element to reduce distortion and peripheral aberrations. In addition three super



ED glass elements, one ED glass element, and two high refractive index glass elements are also used in order to minimise chromatic aberration. The outer optic has a special coating to minimise flare and ghosting.

As for build quality, the outer lens barrels and zoom and focus rings are both metal and the lens is splashproof. The zoom and focus rings turn smoothly and offer precise control. Since Panasonic MFT cameras employ in-camera image stabilisation, the 7-14mm lens is not itself stabilised.

Autofocus is accurate, lightning fast, and virtually silent. The barrel hosts an L-Fn button, whose function can be customised from the camera body. In terms of image quality, the Olympus 7-14mm delivers an impressively sharp centre at 7mm, although as is typical with wideangle zooms the corners and edges are

visibly softer. Extending it to 14mm though, produces much more even sharpness across the whole frame.

### Verdict

Overall the Olympus 7-14mm performs very well. It's solidly built, handles well and is impressively compact for its specification. Edge and corner sharpness does suffer somewhat at maximum wideangle – especially when it's used wide open – however, this is a common trait in wideangle zooms.



### KEY SPECS

**LENS MOUNT** Micro Four Thirds  
**FILTER DIAMETER** No filter thread  
**BUILT-IN IMAGE STABILISATION** No  
**LENS ELEMENTS** 14  
**GROUPS** 11  
**MAXIMUM APERTURE** f/2.8  
**MINIMUM FOCUS** 20cm  
**LENGTH** 105.8mm  
**DIAMETER** 78.9mm  
**WEIGHT** 534g

### PROS

- Overall image quality
- Very good build quality and handling
- Compact size
- Splashproof

### CONS

- No provision for filters at the moment
- Some softness at smaller apertures

### WDC RATING



## 4 SIGMA 12-24MM F/4.5-5.6 II DG HSM £560

The Sigma 12-24mm f/4-5.6 II is designed for use with full-frame sensors, where it produces an angle of view equal to 122° at 12mm and 84.1° at 24mm. Its main first-party rivals within the ultra-wideangle segment are the much more expensive Nikon 12-24mm f/2.8 (£1,315) and Canon 11-24mm f/4 (£2,800). Sony, meanwhile, offers the DT 11-16mm f/4.5-5.6 (£480) for Sony APS-C cameras using the Sony A-mount.

Build quality impresses, with the 12-24mm combining polycarbonate lens barrels with an aluminium lens hood that is permanently fixed to the front barrel in order to protect the front element and reduce flare. The zoom ring is positioned at the back of the lens, with the manual focus ring located at the front. Both are given a ridged rubber finish to provide extra grip, while an AF/MF switch is in the mid-point of the lens. The Sigma 12-24mm uses an

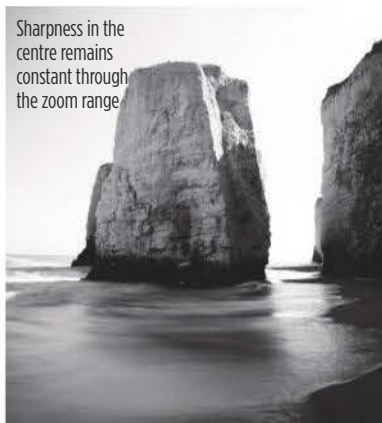


internal focusing system and while the front element does move as you rotate the focus ring, the overall length of the lens remains constant thanks to the fixed lens hood. Focusing is handled via Sigma's Hypersonic Motor (HSM) technology which proves both speedy and quiet in operation.

The lens has 17 elements in 13 groups, which includes four FLD glass elements and one SLD (Special Low Dispersion) element. The lens also has Sigma's Super Multi-Layer coating to minimise flare and ghosting. Image quality is very good, and while a degree of barrel distortion at 12mm is visible this is common to all lenses of this type. Sharpness in the centre of the frame remains constant throughout the zoom's range. Corners are softest at both ends of the focal range with the best results occurring between 15mm and 17mm. Stopping down to f/8 improves things slightly.

### Verdict

The Sigma 12-24mm f/4.5-5.6 II DG HSM delivers excellent results at a highly competitive price. While some might bemoan the lack of a constant f/4 aperture throughout its range, this does seem rather churlish, as most photographers will be using ultra-wide lenses like this to photograph architecture or interiors rather than fast-moving action. In all other respects, the Sigma 12-24mm zoom delivers impressive results.



### KEY SPECS

**LENS MOUNTS** Nikon AF, Canon EF, Pentax K, Sony E  
**FILTER DIAMETER** 82mm via two-part lens cap. Otherwise requires adapter  
**BUILT-IN IMAGE STABILISATION** No  
**LENS ELEMENTS** 17  
**GROUPS** 13  
**MAX. APERTURE** f/4.5-5.6  
**MINIMUM FOCUS** 28cm  
**LENGTH** 120.2mm  
**DIAMETER** 85mm  
**WEIGHT** 670g

### PROS

- Excellent image quality
- Build quality
- Affordably priced
- Focus distance window

### CONS

- Softness in corners at both ends of focal range
- Aperture isn't as fast as some alternatives

### WDC RATING





## 3 SONY CARL ZEISS VARIO-TESSAR FE 16-35MM F/4 ZA OSS £1080

While the full-frame Sony A7, A7R and A7S are excellent cameras, concern was initially expressed about how well wideangle lenses might work on them. They use the same Sony E-mount as used by Sony's APS-C range of CSCs and the concern was that the corner softness and distortion caused by the very short flange-focus distance would be amplified by the A7's larger sensor. Sony's answer: to launch the Carl Zeiss Vario-Tessar FE 16-35mm f/4 ZA OSS.

The lens is made of 12 elements in 10 groups. This includes five aspherical types, including the front 'advanced aspherical' lens, as Sony calls it. These help to reduce curvilinear distortions and aid edge sharpness, while three extra-low dispersion elements help to prevent chromatic aberrations. It uses Zeiss's T\* multi-coating to reduce flare and internal reflections, which helps improve colour

and contrast. Build quality is excellent, with the lens having an all-metal finish which includes raised metal ridges on the zoom and focus rings to aid control. Both rings offer just the right amount of resistance and turn smoothly.

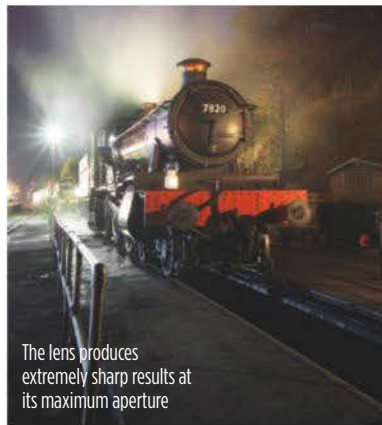
In terms of sharpness, the 16-45mm proves to be the equal of Sony's excellent 24-70mm f/4 optic. While edge sharpness does drop slightly at its 35mm setting, centre resolution remains excellent. What is most impressive, however, is lens performance when used wide open. At f/4 the lens produces impressive images and while stopping down to f/5.6 gives images a bit more bite, stopping down to f/8 makes virtually no difference. While sharpness impresses the 16-35mm does produce some coloured fringing on high-contrast borders. This is most noticeable towards the edges of the image when shooting at f/4 at the 16mm setting. Stopping down to f/8



greatly reduces this, though.

### Verdict

Given that the Sony FE system is still in its infancy, the 16-35mm f/4 is the only real option for Sony users in need of an ultra-wideangle zoom. While it is possible to use pro-grade Sony A-mount lenses via an adapter, in reality the 16-35mm matches them for sharpness. And while the corners do see a drop in resolution, this affects virtually all lenses of this type and size.



The lens produces extremely sharp results at its maximum aperture

### KEY SPECS

**LENS MOUNT** Sony FE  
**FILTER DIAMETER** 72mm  
**BUILT-IN IMAGE STABILISATION** No  
**LENS ELEMENTS** 12  
**GROUPS** 10  
**MAXIMUM APERTURE** f/4  
**MINIMUM FOCUS** 28mm  
**LENGTH** 98.5mm  
**DIAMETER** 78mm  
**WEIGHT** 518g

### PROS

- Lens performance wide open at f/4 • Sharpness
- Smooth zoom and focus rings

### CONS

- Coloured fringing does appear on some high-contrast edges
- High price

### WDC RATING



## 2 NIKON 16-35MM F/4G ED VR £830

Released in 2010, the 16-35mm f/4 carried the distinction of being the world's first ultra-wide zoom to feature Nikon's proprietary Vibration Reduction (VR) image stabilisation technology. Nikon claims this offers up to four extra stops of shutter speed over what would normally be considered 'safe'. Designed primarily for use with FX full-frame cameras, the main alternatives include the older Nikon 17-35mm f/2.8D (£980) and the Nikon 14-24mm f/2.8G (£1,315). While both of those are slightly faster, neither comes with built-in VR. Nikon also offers two DX-specific wideangle zooms: the AF-S DX 10-24mm f/3.5-4.5G ED (£640) and AF-S DX 12-24mm f/4G IF-ED (£840).

While the lens barrels are constructed from polycarbonate the 16-35mm nonetheless feels solid and well built. The lens is split into two

parts, with the thinner back section hosting the zoom ring plus the VR and AF/MF switches, while the front barrel is wider and hosts the manual focus ring. Both rings are covered in ridged rubber for extra grip and are easy to reach.

The lens has 17 elements in 12 groups, which includes two ED glass elements and three aspherical elements along with Nikon's Nano Crystal coating which cuts down on ghosting and flare. Focusing is internal, which means the lens does not extend or contract when zoomed or

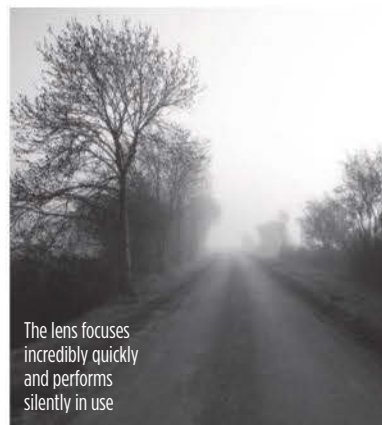
manually focused. The silent wave motor is quiet too.

Optical quality really impresses. There is no chromatic aberration visible at 16mm, and at 24mm and 35mm it's all but insignificant in practice. Similarly, the zoom's MTF curves are tightly grouped and never dip below the critical 0.25 cycles-per-pixel threshold. At 16mm there is some

obvious barrel distortion, while at 35mm there is slight pincushioning.

### Verdict

While the 16-35mm f/4 doesn't have an all-metal build, it impresses, particularly in relation to its critical resolution. If you need a faster aperture, there's Nikon's 17-35mm f/2.8 and 12-24mm f/2.8, but neither has built-in stabilisation. For the price, the 16-35mm f/4 is still the standout optic in Nikon's ultra-wideangle zoom line-up.



The lens focuses incredibly quickly and performs silently in use

### KEY SPECS

**LENS MOUNT** Nikon FX  
**FILTER DIAMETER** 77mm  
**BUILT-IN IMAGE STABILISATION** Yes  
**LENS ELEMENTS** 17  
**GROUPS** 12  
**MAXIMUM APERTURE** f/4  
**MINIMUM FOCUS** 29cm  
**LENGTH** 124mm  
**DIAMETER** 82.4mm  
**WEIGHT** 680g

### PROS

- f/4 constant maximum aperture • Build quality
- Silent focusing • Vibration Reduction (VR) built-in

### CONS

- Quite big and heavy
- Some pincushion distortion at 35mm

### WDC RATING



# Canon

## EF 11-24mm f/4L USM

### £2,800



1

Ultra-wideangle zooms don't get much better than this

WWW.CANON.CO.UK

Released in the spring of 2015, the Canon EF 11-24mm f/4L USM holds the distinction of being the world's widest rectilinear zoom lens. Obviously, at nearly £3,000 it doesn't come cheap, however for those with deep pockets or for those who make a living from architectural or interior photography, it is just about the best ultra-wideangle zoom lens money can buy. Those on a tighter budget might want to look instead at the Canon EF 17-40mm f/4 L USM (£500). In addition, Canon also offers two 16-35mm options for those who don't require the extra width offered by the 11-24mm f/4: the excellent Canon EF 16-35mm f/4L IS USM (£650) that comes with built-in image stabilisation technology, and the professional-grade Canon EF 16-35mm f/2.8L II USM (£1,065) that doesn't.

Providing an angle of view that equates to 126° at 11mm, the Canon 11-24mm is constructed of 16 elements in 11 groups. This includes four aspherical elements to tackle distortion, plus ultra-low dispersion (UD) and super ultra-low dispersion elements. The lens also employs three different types of lens coating to guard against aberrations, ghosting and flare. Canon's Ultrasonic Motor (USM) technology is also on hand to quietly drive the autofocus system, with a full-time manual-focus override also present that allows you to adjust focus manually while in AF mode without having to flick the AF/MF switch.

As might be expected of a Canon L-series lens, build quality is first class. Lens barrels are constructed from metal, with the bulbous front element further protected by a polycarbonate lens hood that's fixed

in place. While it's impossible to attach filters directly to the front of the lens, Lee Filters has recently released an adapter ring for the Canon 11-24mm that can be used in combination with its SW150 Mark II filter system. Given the size of the front element and the ultra-wide angle of view you can expect some vignetting however.

Image quality from the Canon 11-24mm is truly remarkable. It's at its sharpest when used at 16mm at around f/8-f/11. While the fall-off from centre to edge sharpness is most notable when the lens is used at 11mm, the MTF curves produced by the Canon 11-24mm remain very impressive overall. At 16mm there is virtually no barrel or pincushion distortion either. Used at 11mm there is, inevitably, some barrel distortion although it's not as severe as you might expect. Likewise, at 24mm some pincushion distortion is

evident, although this is easy enough to fix by applying the appropriate lens profile correction using DxO or Adobe software. Used wide open, vignetting is subtle at 11mm and can be removed altogether by stopping down to f/8. Some fringing does occur on high-contrast borders, but is generally well controlled.

### Verdict

The Canon 11-24mm f/4L USM is undoubtedly one of Canon's finest L-series lens to date, and one of the finest – if not the finest – rectilinear wideangle zooms ever made. While its high price does put it out of reach for all but the most well-heeled enthusiasts, for professional architectural or interior photographers it's the best that money can buy, offering exceptional optical performance and tank-like build quality.

### KEY SPECS

**LENS MOUNT**  
Canon EF  
**FILTER DIAMETER**  
Requires filter holder  
**LENS ELEMENTS** 16  
**GROUPS** 11  
**MAX. APERTURE** f/4  
**MINIMUM FOCUS**  
28cm  
**LENGTH** 132mm  
**DIAMETER** 108mm  
**WEIGHT** 1,180g

### PROS

- Exceptional optical performance
- Build quality

### CONS

- High price
- Large and heavy

WDC RATING



The lens allows you to cram a huge amount in the frame and was particularly useful for this automotive rig shot



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# Gitzo GK1555T-82TQD Traveler tripod kit £819

WWW.GITZO.CO.UK

What do you get the photographer who has everything? Well, perhaps one of the latest Gitzo Traveler tripods. The company pioneered both carbon-fibre construction and the now ubiquitous reverse-folding leg design, and its latest models to use these technologies are lightweight, tall and strong – but very expensive. Alongside the five-section GK1555T version, there are three four-section models in different sizes, sold either as leg sets only or in kits with a matched ball head.

With Gitzo's carbon eXact tubes and twist G-locks that include O-ring seals to stop grit or water getting in, the Traveler is quick to set up and reaches a decent height at full extension, but folds down to just 35.5cm. The sculpted central 'spider' and ball head are both beautifully cast from magnesium alloy. All four leg locks

can be undone together, requiring just a short turn to tighten again, and the rubber feet can be unscrewed and replaced with spikes. The sliding centre column can be replaced by a short column for low-level work.

As we'd expect from Gitzo, the GK1555T is superbly made. It is capable of holding a full-frame DSLR and large zoom lens with ease (it's rated to hold 10kg). I'm not quite as convinced by the ball head, although it does its job and the clever design fits neatly between the legs when folded down. But camera movement isn't as smooth as it could be, and the main lock has to be unscrewed a long way to release it. There's no separate friction control, either. If money were no object, I'd recommend the leg set unreservedly, but consider looking around for a better head. **AW**



## PROS

- Well made
- Lightweight
- Quick to set up

## CONS

- Price • No separate friction control



### Arca Swiss compatible

The quick release adopts the now de facto standard dovetail pattern.

### Dual-angle legs

Standard and low-level positions are available via slightly fiddly sprung levers.

### Short centre column

Supplied as standard, this short centre column allows low-level shooting.

### Levelling line

The ball head has a handy visual guide to see when it's set level.

"It reaches a decent height but folds down to just 35.5cm"





## LOWEPRO S&F FILTER POUCH 100 £32

WWW.LOWEPRO.COM

Built to survive rugged use, the Lowepro Street and Field Filter Pouch 100 is designed for the working pro and serious enthusiasts who'd like to store large rectangular or square-format filters. The lid opens away from the body, making it simple to get to the internal organiser when it's attached to a vest, harness or belt. The internal organiser takes ten filters and is colour coded to help identify them. You can store your filter holder inside too, though the sleeves aren't as soft as those in some other pouches. The lid prevents water ingress and a push clip keeps it securely fastened. It's ideal if you own a Lowepro bag and you're after a large filter pouch to complement it. **MT**



## LEEF IBRIDGE IOS MICRO SD CARD READER £34.99

WWW.LEEFCO.COM

It's easy to fill up the memory on your iPad or iPhone while taking pictures, but the Leef iBridge can help. It slots into the Lightning connector port and, using the Leef Mobile Memory app, allows you to view images and some types of video on your iPhone or iPad. We viewed photos and MP4 videos shot on a GoPro, but videos larger than 1920 x 1080 may stutter when played back. Stick to videos that have been sized/compressed for a mobile device and you'll be able to watch full-feature films. The iBridge worked well, and the curved design meant it was easy to hold securely without the risk of knocking it and damaging the connection on the iBridge or iPhone. A very neat device. **RS**



## Manfrotto 804RC2 Mark II 3-way head £79

WWW.MANFROTTO.CO.UK

Manfrotto's Mark II version of its 804RC2 three-way head is a small but welcome update to this highly regarded piece of kit. The only real change is to the control handles, with the two longer ones adopting the sliding collapsible design we previously saw on the more expensive XPRO three-way head, while the small pan lock is now shorter and stubbier. As a result, the new version is much easier to pack up for transport, without compromising its usability.

Otherwise, it's almost the same as its predecessor. At 750g it's not overly heavy, being made from tough Adapto polymer, and it's rated to support a 4kg load. The quick release uses Manfrotto's standard RC2 pattern, and a bubble level helps with keeping the camera straight and level.

I used an original 804RC2 in the studio for product shots, and found it to be a solid and reliable workhorse. It doesn't have the load capacity or friction control of its XPRO bigger brother, and slightly jerky movements can make fine adjustment of the camera position difficult, but it's good value for money and should last for years. **AW**



### PROS

- Good update to excellent original
- Great value

### CONS

- Fine adjustment of camera position can be difficult



## Manfrotto Off Road Hiker 30L £124

WWW.MANFROTTO.CO.UK

Manfrotto has a host of products aimed at the outdoor and hiking market, including the Manfrotto Off Road Hiker 30L. The bottom of the bag features a padded, removable camera module that takes up just under half the space available, with a zip on the side for easy access to your kit without needing to go through the top. I found the module was large enough to comfortably house a Canon EOS 5D Mark III with Canon EF 100-400mm f/4.5-5.6L IS attached, as well as two large primes. Internal dividers can also be adjusted to house any kit up to that size. There's also ample space for storing any hiking essentials above the camera module. The areas are

separated by thick material, but this can be unzipped and the camera module removed.

The Off Road Hiker 30L is very large and is likely to be heavy when fully packed. For this reason, there's an adjustable padded waist belt and additional padding as well in the lower-back area.

I used the Off Road Hiker 30L to carry some very heavy kit for a couple of miles. I found it to be very comfortable – it offered a great deal of support and didn't cause any discomfort. While I don't think it will replace my day-to-day kit bag, it serves its purpose well. For those who need a dual-purpose hiking bag that can be used with or without camera kit, it's excellent. **CMR**



### PROS

- Spacious
- Comfortable to carry when full

### CONS

- Not very much at all





# Canon G5 X £629

With a wealth of physical controls, the Canon PowerShot G5 X is aimed at the enthusiast photographer

WWW.CANON.CO.UK • TESTED BY CALLUM MCINERNEY-RILEY

Canon's recent launch of the PowerShot G9 X and G5 X was designed to bolster its current range of enthusiast compacts. The G5 X sits above the PowerShot G7 X, and it would appear that Canon has taken on board comments from consumers with regard to that camera. At first glance, the G5 X looks as if it's designed to offer everything the enthusiast photographer had hoped for from the G7 X but didn't quite get. While the G7 X's image quality and lens are good, it doesn't excel in terms of handling. As a result, the G5 X takes it up a notch with an excellent electronic viewfinder, a wealth of customisable buttons and controls, and a more comfortable grip, all of which vastly improve its handling, albeit at the expense of its size.

## FEATURES

Inside the PowerShot G5 X is a 1in, back-illuminated sensor with a resolution of 20.2 million pixels. This is likely to be the same Sony-made sensor that we first saw inside the Sony Cyber-shot DSC-RX100 II back in 2013, and which has featured inside several high-end compact cameras since.

It's the same sensor as that used in Canon's PowerShot G3 X, G7 X and G9 X. It's a popular sensor for good reason – but more on that later.

Equally impressive is the 8.8-36.8mm f/1.8-f/2.8 lens, which is equivalent to 24-100mm in 35mm terms. This focal range covers everything from landscapes to portraiture. The additional range at the long end, while maintaining its f/2.8 aperture, gives it the edge on its competitors. The Sony Cyber-shot DSC-RX100 IV features a Carl Zeiss Vario-Sonnar T\* 24-70mm equivalent f/1.8-2.8 lens, while the Panasonic Lumix DMC-LX100 has a Leica DC 24-75mm f/1.7-2.8. Housed inside the lens are nine rounded aperture blades, which should help afford a pleasing look to out-of-focus areas of pictures. A 5cm minimum-focusing distance means it's easy to shoot close-ups.

The lens also has intelligent five-axis optical stabilisation, which Canon claims will allow handholding at up to three stops slower than normal. It's usual for manufacturers' claims to fall on the generous side, but I was able to shoot at 1/10sec in low light and still get a usable shot.

A three-stop built-in ND filter is featured on the G5 X. This allows

## KEY SPECS

**SENSOR** 20.2MP, 1in BSI CMOS  
**OUTPUT SIZE** 5472 x 3548  
**FOCAL LENGTH** MAG 2.7x  
**LENS** 24-100mm equivalent f/1.8-2.8  
**FILE FORMAT** JPEG, Raw (CR2), JPEG+Raw  
**SHUTTER SPEEDS** 30-1/2000 sec + bulb  
**ISO** 125-12,800 + auto  
**EXPOSURE MODES** PASM, smart auto, scene  
**METERING** Spot, Evaluative, Centre  
**DRIVE** 5.9fps, 4.4fps with AF  
**MOVIE** Full HD, 60, 50, 30, 25, 24fps  
**VIEWFINDER** 2.36-million-dot OLED EVF  
**DISPLAY** 1.04-million-dot 3in fully articulated touchscreen  
**FOCUSING** 31-point contrast detection  
**MEMORY CARD** SD, SDHC, SDXC  
**DIMENSIONS** 112.4 x 76.4 x 44.2mm  
**WEIGHT** 377g (incl. battery and card)

users to shoot with wider apertures in bright conditions or to slow down shutter speeds, which is good for portraits and capturing motion in images. The ND filter can either be set to on, off or automatic.

An extensive sensitivity of ISO 125-12,800 is offered. Like many of Canon's recent DSLR cameras, including the Canon EOS 750D, the PowerShot G5 X uses the Digic 6 processor and shoot both Raw and JPEG formats. Canon states a 5.9fps shooting speed with focus fixed at the start of the burst, and 4.4fps with autofocus between frames. However, this is for JPEG only, and when shooting Raw the speed is much slower. I found when shooting Raw + JPEG large, I could take approximately six shots in ten seconds. In Raw only it's slightly faster, but still well over one second per Raw image.

The G5 X just doesn't buffer and process the large Raw files, making it poor for wildlife and sports shooters, who need to rattle off frame after frame.

The G5 X has Wi-fi compatibility and can connect using dynamic NFC. This allows users to send photos and video to their smartphone and tablet. It's also



AWB and evaluative metering perform fantastically with little need to adjust



possible to control the camera remotely from your smart device via the app, and there's wireless connectivity to a variety of Canon printers, too.

Above the viewfinder is a pop-up flash and a hotshoe. The pop-up flash is powerful and I found it lit up a large group of ten people at a range of around 3m. It boasts a sync of 1/2,000sec and can be adjusted 32 EV. With the hotshoe, users can attach a Canon-fit flashgun and use it with ETTL, just like a Canon DSLR.

Video can be captured at a

maximum resolution of 1080 x 1920 at a frame rate of 60, 50, 30, 25 or 24fps as well as lower resolutions at 25fps or 24fps. Thanks to the five-axis stabilisation, the video I captured looked very smooth and was of reasonable quality.

The G5 X uses a rechargeable Lithium-ion NB-13L battery, which is rated up to 330 shots in eco mode and 210 shots using the LCD and EVF. I found for a day's shooting the battery lasted well, and the addition of micro USB charge capabilities is excellent. It means it's possible to

quickly top up the battery from a power bank or from an Android phone charger. Canon has also included an external charger, which is quicker than using USB.

## BUILD AND HANDLING

When Canon brought out the G5 X and the G9 X, they were designed to sit either side of the G7 X. The G9 X is a smaller and simpler version of the G7 X, while the G5 X is designed to be a bigger camera with more manual controls. Overall, the G5 X has a feel that would suit the discerning enthusiast, being more akin to a DSLR than it is to a point-and-shoot compact.

On the front is a large rubberised hand grip, which is curved and tapers off towards the lens. At the rear of the camera is a large thumb grip that is moulded inward towards the exposure-compensation dial. These make the camera comfortable to hold, carry and shoot with.

Overall, the G5 X trumps both the G7 X and its main competitor, the Sony RX100 IV, for the best user experience. However, in the size department the G5 X is considerably larger than either, measuring 112.4 x 76.4 x 44.2mm



This portrait was lit with a small softbox and a flash fired off-camera, thanks to the Canon hotshoe

and weighing 377g, so it can't be slipped into the pocket of a pair of jeans with ease. I carried it in my coat pocket in winter but in spring and summer, it'll probably require a carry strap or a case. For me, what the G5 X loses in portability it makes up for in usability, but the G7 X and G9 X may be better options for those wanting to go small.

At the front of the camera is an unusual-looking dial. Due to the shape of the camera, I found it easier to adjust this dial with my middle finger.

On the top of the camera is a large exposure-compensation dial, which is controllable from +/-3EV in 1/3-stop increments. It's a fantastic asset to the camera.

Around the lens is another control ring, which, by default, allows users to change aperture in manual mode. At the rear of the camera is a d-pad that doubles as a scroll wheel. Inside shooting menu 2 is a sub-menu called function assignment. This allows users to activate and assign aperture, ISO, manual focus and shutter speed to the various dials. It's also possible to assign different functions in Av, Tv and Manual modes. In the same menu are numerous button assignments that allow photographers a wealth of customisation options.

For those users who like to rely on a touchscreen interface for

## “The Canon G5 X's OLED EVF is large, positioned perfectly and has a 120fps refresh rate”

changing control, this camera has that option. However, with the huge number of buttons I found myself relying on the touchscreen relatively little.

Overall, the buttons aren't too fiddly and are well placed around the body, which isn't always the case with compact cameras.

The touchscreen and quick menu resemble that of Canon's other compact cameras, while the main menus are all colour coded and well laid out much as they are on Canon's DSLRs.

## LCD AND VIEWFINDER

The G5 X distinguishes itself from the competition with its LCD and viewfinder combination. The 2.36-million-dot electronic viewfinder gives impressive resolution, colour accuracy, contrast and refresh rate, but the most interesting point about the EVF is its positioning.

Increasingly, more compact cameras try to cram in a viewfinder somewhere, so users have an alternative to the LCD. This usually means the viewfinder is small and positioned on the far left of the

camera. This can make it awkward to use, and any eyecup – if it exists at all – is so small it can allow light to ingress, making visibility poor in certain conditions. Canon has placed a large EVF directly over the lens, making it the centrepiece of the design. This placement does increase the size of the camera, but it also adds to the DSLR-like feel that Canon is aiming to achieve.

I found myself using the EVF far more than I did the LCD, and having used many compact cameras, this is the first time I've defaulted to the viewfinder rather than it being my second choice.

All the information a user is likely to need is displayed in the viewfinder. One really neat feature is that if the camera is turned to portrait format, all the information flips around with it – a feature usually reserved for high-end CSCs.

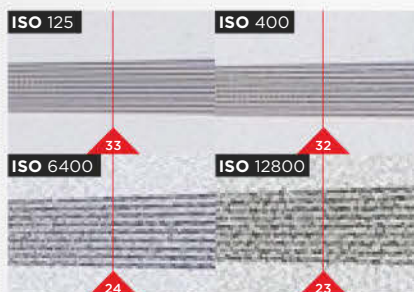
There's also a seriously good LCD panel. This 3in, 1.04-million-dot touchscreen is one of the highest-specification screens we've seen on a compact camera. Being fully articulated, it can be used to shoot from high or low vantage points, as well as being able to shoot at arm's length. I found the touchscreen also improved the handling of the camera. Most notably, I love the ability to use single point AF and simply assign the focus point using the touchscreen. It was handy to

## Image quality



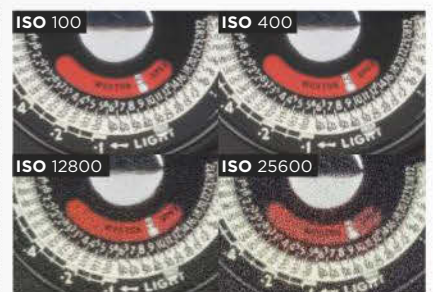
### COLOUR

Straight out of the camera, the JPEG images are very bright and punchy. Skin tones are rendered particularly well and even cold wintry scenes have a colourful charm about them. In a wide range of lighting conditions, the auto white balance was consistent and accurate, and the presets are also spot on. There are a variety of picture styles for the JPEG images on the PowerShot G5 X, including landscape, portrait and vivid. When shooting Raw + JPEG, however, picture style is annoyingly greyed out in the menu.



### RESOLUTION

When it comes to resolution, the G5 X gets about as much out of its sensor as we could hope for, continuing the trend established by the G7 X and G3 X. At its base sensitivity of ISO 125, it resolves around 3,300 l/ph and drops only slightly at ISO 400 to 3,200 l/ph. Beyond this, noise has an increasing impact on resolution, but even at ISO 1600 results are very credible. However, at higher settings, the sensor's ability to register fine detail deteriorates more quickly, and by ISO 12,800 resolution has dropped to just 2,300 l/ph.



### IMAGE NOISE

At low ISO settings, the Canon PowerShot G5 X gives excellent images with plenty of detail and little noise. Indeed, files are still very usable at ISO 800, particularly if you're prepared to shoot and process Raw files. In comparison, Canon's standard JPEG processing tends to blur away fine details. Stick with Raw, though, and it's only at ISO 1600 that noise starts to have a significant impact on fine detail. At ISO 3200 there's a stronger drop in image quality, with shadow detail noticeably deteriorating, but it's still fine for non-critical uses.





launch the quick menu on-screen and touch whatever setting I wanted to change, without having to mess around with a d-pad to navigate to certain options.

There's a range of information on the shooting screens, but the most interesting is the live histogram and the automatic level gauge provided by a built-in gyroscopic sensor.

AUTOFOCUS

Canon's Artificial Intelligence Auto Focusing system (AiAF) is on board the G5 X, with 31 contrast detection

focus points. It's designed to analyse scenes and identify the subject to achieve a better focusing performance.

As you would expect, there are options for one-shot – Canon's term for single focus – and Ai Servo, which is Canon's term for continuous focusing. In both modes, I found the focusing to be perfectly adequate for day-to-day shooting in moderate light, but the contrast-detection focus system has issues with low-contrast scenes, especially in low light.

Being small and light, the G5 X made for a great companion to take fishing

The focus-assist beam certainly improves things, but it's still rather slow, especially at the telephoto end. Occasionally, the focusing will hunt for an area, fail to find the subject, illuminate the focus point as green and just stop trying. This means you have to restart your focusing, which can be a bit annoying.

Manual focusing has a few nice features. In the menus, it's possible to turn on focus peaking, which will highlight high-contrast edges to indicate when a subject is in or near optimum focus. Also, manual focus can be assigned to different control wheels. By default, the focusing is set to the d-pad scroll wheel at the rear of the camera, but I found assigning it to the lens control ring gave an almost mechanical feel to it, and meant I could use the viewfinder at the same time.

METERING

Throughout my time using the PowerShot G5 X, I rarely needed to correct the metering. The only time it really needed to be changed was when I wanted to intentionally under or overexpose an image.

For the most part, I used evaluative metering, but the touchscreen makes spot metering much more usable. I also found it very useful for high-contrast scenes that surpass the dynamic range of the camera.

Verdict

Sony has led the way in the enthusiast compact market since the launch of the Cyber-shot DSC-RX100 several years ago. The 1in sensor was a game-changer, but manufacturers such as Panasonic and Canon are snapping at the RX100's heels.

Canon's first attempt was the PowerShot G7 X, and while it boasts a decent lens and good image quality, it's somewhat sluggish in operation and lacks a viewfinder. However, with the G5 X Canon has ticked all the right boxes on the enthusiast's wish list. Its handling makes it truly feel like a serious camera that's easily comparable to a high-end CSC or even a DSLR. This is mostly due to the 2.36-million-dot OLED EVF, which is large, positioned perfectly, and has a 120fps refresh rate with great colours and contrast.

With the rear thumb grip and rubberised grip at the front, the camera feels very comfortable to shoot with. It's also impressive in terms of image quality, giving good, clean results right up to ISO 800. Image quality

deteriorates thereafter, but usable shots can be made right up to ISO 3200. The dynamic range at low sensitivities is very impressive and at ISO 400 it's still respectable.

For the most part, the Canon PowerShot G5 X is either on a par with or better than its competition, although burst speed and autofocus are its downfall. Taking more than a second to shoot, buffer and save a Raw file can be frustrating, and while the autofocus is acceptable for the majority of situations, it's not super-fast, especially in low light.

For many users, though, the continuous shooting rate and super-fast autofocus won't be a priority from a pocket camera such as this. The G5 X is aimed at the enthusiast photographer who doesn't want to carry a DSLR but still wants a camera to handle like one without compromising heavily on image quality. For a user who wants that level of handling, excellent image quality and a fast lens with a good zoom range, then the G5 X is a sound choice.

**BEST FOR**

- Photographers who want a good zoom range
- Those who want a carry-around compact with the functionality of a DSLR

**PROS**

- Large sensor compared to camera size
- Fast zoom lens
- Great JPEG colour rendition
- Excellent electronic viewfinder

**CONS**

- Relatively slow autofocus
- Slow to write Raw files
- Not truly a pocketable camera

FEATURES	19/20
PERFORMANCE	18/20
DESIGN	18/20
IMAGE QUALITY	19/20
VALUE	19/20

**WDC RATING**

# Fujinon

## XF 35mm f/2 R WR £299



The sweet spot of edge-to-edge sharpness is found between f/4 and f/5.6

How does this new lens shape up against its predecessor, the XF 35mm f/1.4 R?

WWW.FUJIFILM.CO.UK • TESTED BY MICHAEL TOPHAM

One lens we've been eager to get our hands on ever since the first rumours started circulating is the Fujinon XF 35mm f/2 R WR. As many X-series users will be aware, Fujifilm already has a wide-aperture 35mm lens in its range of XF prime lenses, which begs the question, why the need for another?

The XF 35mm f/2 R WR has a different design compared with the three-year-old XF 35mm f/1.4 R. Although the maximum aperture is a stop slower, the lens is lighter and smaller, so it's a good match with all X-series cameras, including the smallest entry-level models.

### Features

The focal length presents a natural perspective that's equivalent to 53mm in 35mm film terms. By making the front element smaller and limiting the maximum aperture to f/2, the lens is compact and light.

The lens is made up of nine elements in six groups, with two elements being of the aspherical type. It features nine diaphragm

blades, which should see it render rich circular bokeh.

The weather-resistant design protects it from the rain, dust and humidity that can force us to stow our kit away to prevent damage.

Like other Fujinon primes, the XF 35mm f/2 R WR doesn't feature optical image stabilisation. This is not always deemed entirely necessary on a lens of this focal length anyway. Compare the minimum focusing distance of this lens to the XF 35mm f/1.4 R and it's

The WR designation at the front signifies the lens is weather-resistant

the older model that has the edge. While the new lens has a near-focus limit of 35cm, the XF 35mm f/1.4 R can focus within 30cm.

The focusing performance of this new lens is far superior to that of the XF 35mm f/1.4 R. Internal focusing prevents the front of the barrel protruding, and this newer lens is much quieter. It's faster, too. When partnered with the X-T10, it latched onto subjects accurately in a fraction of the time that it took to find focus using the XF 35mm f/1.4 R. Fujifilm has rated the autofocus acquisition speed at 0.08sec and it feels this rapid in use.

### Build and handling

Fujinon prime lenses have a reputation for being engineered to a high standard and the XF 35mm f/2 R WR is no exception. It is solidly made, and its metal and glass construction gives it a premium feel. There's a difference in diameter between the rear and the front of the lens, resulting in the aperture ring being slightly larger than the manual focus ring in front. The lens





looks smart attached to X-series cameras, and doesn't look or feel out of place when it's coupled to the smallest entry-level models, such as the X-A2. Our review sample was supplied in black, but those who chose their X-series camera in silver will be glad to know this lens is also available in silver to match.

The quality of this lens isn't just in its appearance, though – it also operates precisely and smoothly. The aperture ring clicks through its range in 1/3-stop increments, and there's a firm feel when it's turned. The same can be said about the manual-focus ring. It's not as loose as on the 35mm f/1.4 and feels much more refined. One possible explanation for this improvement is the addition of internal weather seals. When you uncouple the lens from the camera, you'll notice a rubber ring at the rear that effectively seals it against the metal lens mount.

The absence of switches on the barrel preserves a clean and minimalist appearance. While it is a smaller and more compact lens, I found the difference in weight was negligible when comparing it to the XF 35mm f/1.4 R.

Image quality

Fujifilm X-series users will want to know how well the new lens fares against the XF 35mm f/1.4 R. I'm glad to report that the new model is an optically sound lens that delivers some seriously decent results. Running a series of comparison tests with both 35mm lenses set to the same aperture revealed that the new XF 35mm f/2 R WR produces fractionally sharper results in the centre of the frame when the aperture value was set to f/2. That said, corner sharpness struggles to match the same level of sharpness as the centre, so it's worth remembering to compose subjects as central to the frame as possible when shooting wide open.

Repeating the comparison process after stopping both lenses down to f/4 and f/5.6, I found my results were as sharp as each other across the frame. Diffraction starts to soften the finest detail at f/11 and f/16, so to preserve optimum sharpness from edge-to-edge users will ideally want to shoot between f/4 and f/5.6.

The new lens vignettes more than the XF 35mm f/1.4 R wide open,

with corners appearing approximately 0.9EV darker than the centre at f/2. This vignetting isn't overly offensive, though, and it's quickly removed by stopping the lens down to f/2.8. Chromatic aberrations are handled reasonably well, with only minor purple and green fringing being traced along high-contrast edges. Vignetting and chromatic aberrations should be a quick one-click fix as soon as a lens profile is made available as part of an Adobe update.

Distortion was well controlled on the XF 35mm f/1.4 R, so how does it compare on this lens? Whereas the older 35mm f/1.4 is prone to modest barrel distortion, this lens produces a negligible amount of pincushion distortion. This was auto corrected in JPEG files thanks to the X-T10's effective in-camera processing. While not immediately obvious in Raw files, users will be able to correct for distortion in the future by enabling a lens profile.

Verdict

This is up there as one of my favourite X-series lenses. Yes, it's a stop slower than the XF 35mm f/1.4 R, but its petite size is perfectly matched to X-series cameras such as the X-T10 and X-T1. The fact it's less bulky makes the camera feel just that little bit more comfortable to carry around, and the tactile feel of the aperture and manual-focus rings makes it pleasing to operate. Centre sharpness is magnificent at f/2, and it focuses in an ultra-quiet and super-responsive manner. Add weather-resistance to the mix and you've got an incredibly powerful lens that looks great, feels great and has the performance to match. It's perfect for street, portraiture and reportage photography, and at £300 it's a fantastic entry point for X-series users looking to purchase their first prime. Unless you need the extra stop that the XF 35mm f/1.4 R provides, I'd settle for this lens ahead of it.

Lab Tests

RESOLUTION

The lens produces impressive sharpness in the centre of the frame at f/2, and continues to get sharper as the aperture is closed. The sweet spot of edge-to-edge sharpness is found at f/5.6.



CURVILINEAR DISTORTION

The lens exhibits signs of pincushion distortion. Interestingly, this is a different result from the Fujinon XF 35mm f/1.4 R lens, which we found produced a negligible amount of barrel distortion.



KEY SPECS

- FILTER DIAMETER 43mm
- LENS ELEMENTS 9
- GROUPS 6
- APERTURE f/2-16
- MINIMUM FOCUS 35cm
- LENGTH 45.9mm
- DIAMETER 60mm
- WEIGHT 170g
- LENS MOUNT Fujifilm X-Mount

Opening the lens to f/2 creates a very attractive shallow depth of field



PROS

- Small size complements X-series cameras
- Fast focusing
- Weather resistant
- Clean, stylish design

CONS

- Pincushion distortion
- Vignettes more than the XF 35mm f/1.4 R

WDC RATING





# Sigma

## 20mm f/1.4 DG HSM | A £799

The lens is ideal when you're working in tight spaces or want to fill the frame with your surroundings

Sigma has created a world first with its latest wideangle fixed-focal-length lens

WWW.SIGMA-IMAGING-UK.COM • TESTED BY MICHAEL TOPHAM

The 20mm f/1.4 DG HSM | A is Sigma's fifth prime in its DSLR Art line of premium lenses and could be popular for landscapes, astrophotography, interiors, events and weddings.

Just as Sigma's 24-35mm f/2 DG HSM | A was the world's first zoom with a constant aperture of f/2, the 20mm f/1.4 DG HSM | A is the world's first 20mm lens with an f/1.4 aperture. The only similar lenses are the Canon EF 20mm f/2.8 USM (£385) and the Nikon AF-S Nikkor 20mm f/1.8G ED (£539), so is this Sigma worth paying a premium for?

### Features

A 20mm f/1.4 lens has never been manufactured before because of the technical difficulties. Sigma's engineers have overcome this by using the latest advances to create a large double-aspherical lens that measures 59mm in diameter. Sigma has united this large aspherical lens with a second aspherical lens at the rear, to control distortion.

There are 15 elements in 11 groups: two of these elements being the 'F'

low-dispersion (FLD) type and five being the special low dispersion (SLD) variety. This low-dispersion glass is used to curtail chromatic aberrations, which are often an issue in large-aperture ultra-wide lenses.

To prevent flare and ghosting problems when shooting into the light, Sigma has employed its Super Multi-Layer Coatings and a petal-shaped permanently attached hood.

The lens's nine-bladed aperture diaphragm offers settings from f/1.4

The build quality of the lens is excellent and the large manual focusing ring operates fluidly



to f/16, and at its maximum aperture provides an attractive rendition of out-of-focus backgrounds with pleasing circular bokeh in the highlights. To ensure the lens operates as smoothly and as quietly as possible, it features Sigma's Hyper Sonic Motor (HSM) that, in addition to driving the AF system, offers full-time manual focusing – which lets you adjust the focus manually at any time without having to flick the AF/MF switch to manual first.

The size and weight imply that it will feel at its best paired with full-frame DSLRs, but nothing suggests it can't be used with APS-C DSLRs. Coupled to an APS-C DSLR with a 1.5x crop factor, it behaves like a 30mm f/1.4, while on Canon APS-C DSLRs it's equivalent to 32mm.

Other features include a minimum focusing distance of 27.6cm, a maximum magnification ratio of 1:7.1 and full compatibility with Sigma's USB docking device, allowing users to update firmware and refine the focus settings manually using Sigma's Optimization Pro software.

In the box is a rear cap and a



sizeable front plastic cap, which has a felt-like lining to create a tight fit. Sigma also produces a metal lens cap (LC907-02) for £30.

Build and handling

The lens is more compact than I'd envisaged and the front element is smaller than is typical on fast full-frame wideangle zooms such as Nikon's AF-S Nikkor 14-24mm f/2.8 G ED. It's heavier than it looks, too.

The build quality is comparable to other lenses in Sigma's Art line-up and the barrel is constructed from a mixture of metal and plastic. The section of the barrel adjacent to the camera is metal, just like the large manual-focus ring at the front of the lens, while the middle section of the barrel and lens hood are formed of high-quality plastic. The only lack is there's no weather sealing.

The fixed lens hood helps to shield the glass from accidental bumps and scrapes, but the bulbous front element does prevent screw-in filters being used. Although it has been rumoured that the Sigma 12-24mm f/4.5-5.6 DG HSM II adapter ring Lee Filters produces for its SW150 Mark II system might fit, we tried it only to find it doesn't. Regrettably, no filter adapter was available at the time of testing; Lee Filters told us it would look into creating one if there's enough demand, but it wouldn't arrive for a couple of months.

The manual-focus ring operates fluidly and functions across its focusing range in just over a quarter of a turn. It falls nicely to hand as does the large AF/MF switch that juts out from the side of the barrel and is easy to find with your thumb. This switch offers a reassuring click, and the white background that's revealed behind the switch when it's set to AF acts as a visual reference of where it's set to in low light.

Image quality

Our review sample was supplied in Canon-fit, and I paired it with the Canon EOS 5DS which has a highly impressive level of detail, to see if the lens's results wide open are as impressive as those we've seen from Sigma's previous Art lenses.

Rattling off a series of frames of the same scene from f/1.4 to f/16 and then analysing these alongside our Applied Imaging tests revealed jaw-dropping results. Sharpness in the centre of the frame at f/1.4 is very impressive. Edge sharpness is

a little way off matching the same level of sharpness in the centre at f/1.4, so to record the finest level of edge-to-edge sharpness across the frame you'll need to close the lens down a few stops. Corner sharpness improves by the time you reach f/4 but the sweet spot between centre and corner sharpness is closer to f/5.6-f/8. The lens resolves sharp images beyond these settings and f/11 is certainly usable if you're keen on creating a larger depth of field. Diffraction does begin to soften images a little at f/16, so it's good to see Sigma putting a cap on the lens's minimum aperture.

Equally as impressive is the way curvilinear distortion is controlled. Barrel distortion is negligible straight out of the camera. I did notice signs of purple and green fringing at the edges of the opening image to this review, but only at very close magnification. At the time of testing we were still awaiting a new lens profile update from Adobe. When

this arrives we expect these signs of chromatic aberration and barrelling to be resolved with a single click of the 'Enable Profile Corrections' box beneath the Lens Corrections tab.

Vignetting is clearly obvious when the lens is used wide open. The corners are around 2EV darker than the centre of the image when the lens is used at f/1.4. Closing the lens down to f/2 sees corner shading improve, and dialling in an aperture of f/3.2 sees vignetting clear up almost totally. It's untraceable in images taken at and beyond f/4.

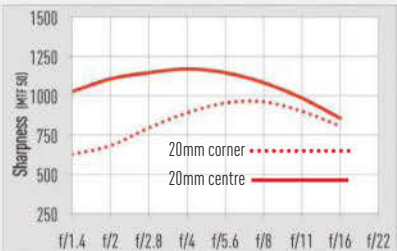
Verdict

This lens is very tempting for those who regularly want to squeeze as much in the frame as possible, and for those who'd like to gain an extra couple of stops when working in low light. By paying a premium for it you get first-class image quality and performance, and only minor negatives. Overall, this is a valuable addition to Sigma's Art line-up.

Lab Tests

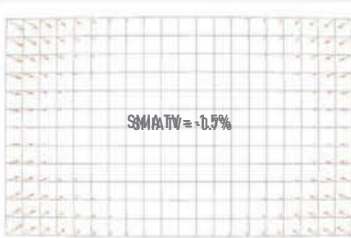
RESOLUTION

The lens resolves a similar level of sharpness in the centre at f/1.4 as it does when it's stopped down between f/8 and f/11. Diffraction does soften detail when you push to its f/16 minimum.



CURVILINEAR DISTORTION

Barrel distortion can be seen in our test results, with straight lines bowing out slightly towards the corners. This should be a relatively quick fix when Adobe releases a lens profile in the future.



KEY SPECS

- FILTER DIAMETER N/A
- LENS ELEMENTS 15
- GROUPS 11
- DIAPHRAGM BLADES 9
- APERTURE f/1.4-f/16
- MINIMUM FOCUS 27.6cm
- LENGTH 129.8mm
- DIAMETER 90.7mm
- WEIGHT 950g
- LENS MOUNT Canon, Nikon, Sigma

PROS

- First-class image quality • Smooth and quiet autofocus
- Robust build • Fastest 20mm prime available

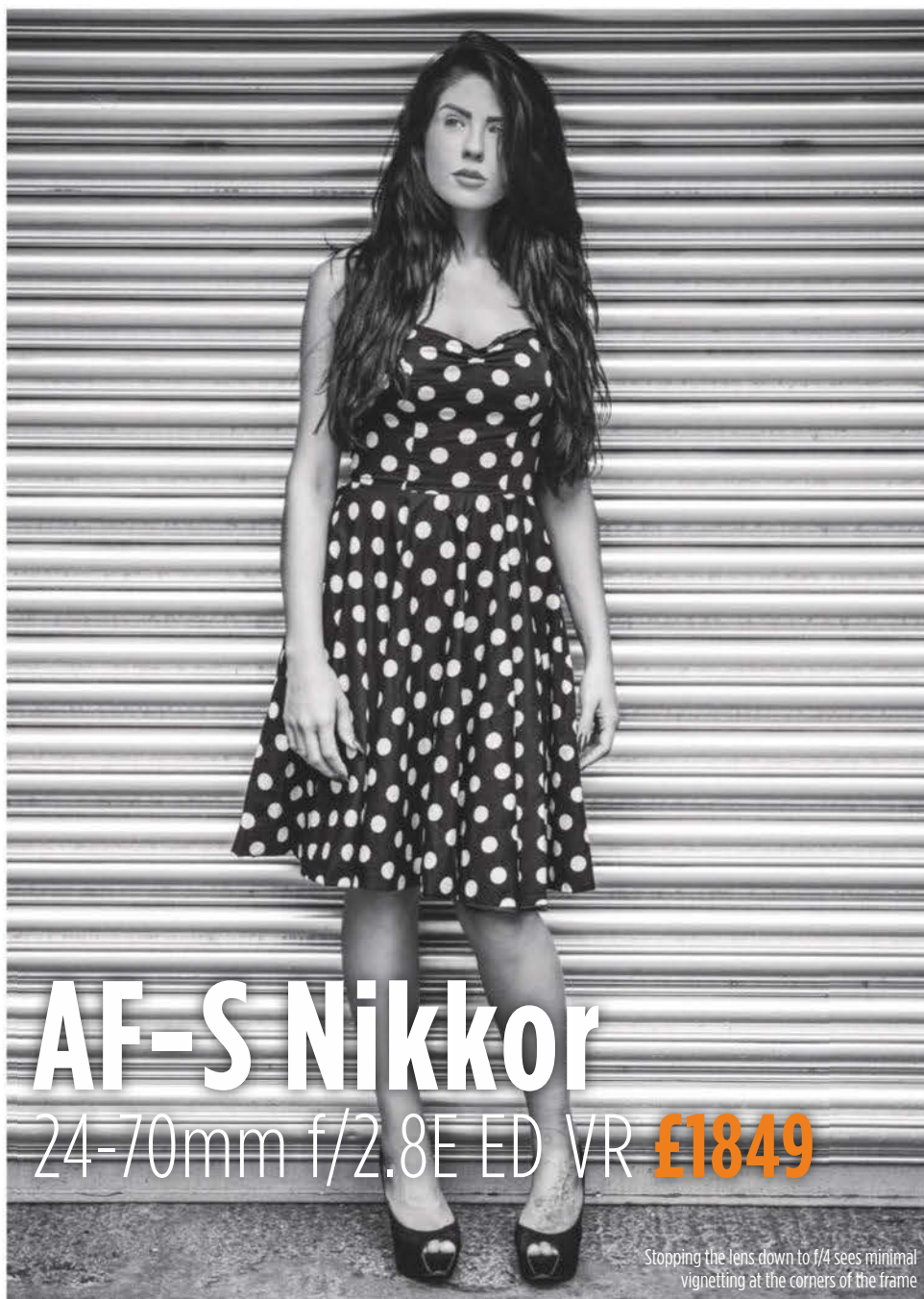
CONS

- No weather-sealing • Screw-in filters can't be used; adapter rings for filters not yet available

WDC RATING



Vignetting is obvious when the lens is used wide open, but it's better controlled when it's stopped down



# AF-S Nikkor

## 24-70mm f/2.8E ED VR £1849

Stopping the lens down to f/4 sees minimal vignetting at the corners of the frame

Is Nikon's latest pro-spec standard zoom its best lens yet?

WWW.NIKON.CO.UK • TESTED BY PHIL HALL



Nikon's Vibration Reduction is a welcome addition and promises up to four stops compensation

One of the most popular lenses for photographers, both professional and enthusiast, is the 24-70mm f/2.8. It's easy to see why, as its fast constant maximum aperture and useful focal range make it incredibly versatile.

Nikon's AF-S Nikkor 24-70mm f/2.8G ED appeared in 2007, at the same time as Nikon's first full-frame DSLR, the 12.1MP D3. It was an instant hit, but with the arrival in recent years of ever higher-resolving

sensors, greater demands were placed on the optics. So will the AF-S Nikkor 24-70mm f/2.8E ED VR do enough to warrant the update?

## Features

Whereas the outgoing G version of the lens had 15 elements in 11 groups, the new lens sports a totally new design, with 20 elements in 16 groups. More telling, though, is the appearance for the first time on a Nikkor of a new Aspherical Extra-Low Dispersion (ASP/ED) element. This has been paired with Nikon's aspherical, ED and High-Refractive Index (HRI) elements, not forgetting the Nano Crystal Coat to reduce ghosting and flare. In addition, on the front and rear elements is a fluorine coating designed to repel water, dust and dirt, as well as making it easier to clean.

The new 24-70mm uses an electromagnetic diaphragm (denoted by the 'E' designation) that's designed to provide highly accurate control of the lens's rounded diaphragm blades. This ensures more consistent exposures during continuous shooting. As expected for a lens of this calibre, there are nine aperture blades.

One of the standout additions is Nikon's Vibration Reduction (VR) anti-shake system. Promising up to four stops of compensation, there's the option of Normal or Active modes, with the latter suited to shooting from a moving vehicle or an unstable position.

If you have a number of pro-spec Nikon lenses, you'll be accustomed to a 77mm filter thread. However, due to the additional internal elements over the older model, this lens sports an 82mm thread. Internal focusing, though, means filters will remain in position and not spin round as the lens focuses.

## Autofocus

While the new lens carries the same AF-S designation as other Nikkor lenses, the silent wave motor (SWM) has been completely redesigned, with Nikon claiming it to be some 50 per cent faster than the older model. I've used the Nikkor 24-70mm f/2.8G for the past eight years and have never had any concerns with AF performance, but the lightning-quick acquirement of the new lens is incredible. Focus noise is almost impossible to pick out in day-to-day use.



## Build and handling

This is a beefy lens that tips the scales at 1,070g and is 154.5 x 88mm, compared to the 24-70mm f/2.8G at 133 x 83mm and weighing 900g. However, when I paired it with a D810, I found the combination balanced together extremely well and was comfortable to use. The larger size has allowed Nikon to include a bigger rubberised zoom ring at the rear of the lens that falls to the hand nicely, providing a silky transition through the zoom range. Moving forward, there's a modest focus-distance-scale window, marked in both feet and metres, before we reach the finely ribbed contour of the manual-focus ring. Identical in size to that used on the outgoing 24-70mm, it rotates anticlockwise from infinity to closest focus (0.38m) with a smooth if slightly light-to-the-touch transition.

On the side of the lens are two switches grouped together. The top switch allows manual override of autofocus to manual operation with virtually no time lag, regardless of the AF mode you're using. Below that is the VR switch, with settings for Off, Normal or Active VR modes. They feel identical, so it's not immediately clear which switch you're selecting if the camera is raised to your eye, but the VR performed very well indeed.

Build quality is first rate. Nikon claims the lens has undergone a series of shock tests and inspections to ensure it can cope with daily professional use. And as well as the fluorine coating there's an O-ring seal around the mount. The exterior is a mix of metal and high-quality plastic, with the familiar dappled-texture finish giving a quality feel.

## Image quality

With a just under 3x focal range, there's not quite the same demands placed on the optics as other lenses, but nonetheless, to deliver the sorts of images that will meet the demands of professionals, results have to be spot on.

Looking at the real-world shots I took, centre sharpness in images taken at 24mm wide open at f/2.8 are very good, although it does tend to render the edges of the frame a little soft. Stop the lens down and the sweet spot for those wanting to shoot at the wide end of the lens seems to be around f/8, when sharpness across the image

is very impressive indeed.

At 35mm and wide open, results are a tad sharper still, and while edge sharpness does gradually drop off a touch it's still a very strong performance, with best results overall appearing to come at f/5.6. It still performs very well at f/8, and while sharpness does tail off after that, it's still strong at f/11 but a little less so at f/16 due to diffraction. It doesn't quite deliver the same levels of sharpness at 70mm, with the centre at f/2.8 only just matching those of the edges at 35mm. That said, there's a big improvement when the lens is stopped down to f/5.6, with the centre matching results at 24mm and 35mm.

As you'd expect with a zoom of this nature, vignetting is most pronounced at f/2.8. There's more than a stop of exposure difference between the centre and edge of the frame at the extremes of the focal range, so you'll need to correct for this in post. You'll also have to make

corrections for slight barrel distortion at 24mm and pincushion distortion from 35mm onwards.

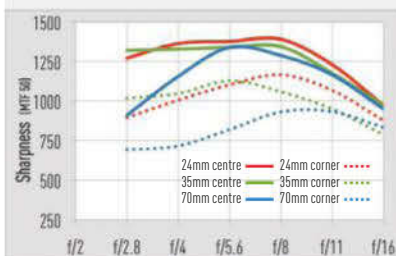
## Verdict

The outgoing G-series of this lens is a very strong performer, but the bigger and heavier (and more expensive) AF-S Nikkor 24-70mm f/2.8E ED VR manages to better it. The inclusion of VR makes it a more appealing option, and while the pay-off is a slightly bulky design, this hasn't hampered the handling. The build quality is first class, while AF speed has also improved and is truly impressive. While vignetting is an issue wide open, the resolving power of the lens, especially at the centre of the frame, is excellent through the zoom range. If you'll use this lens regularly and can justify the steep asking price, you'll be rewarded with a superb fast standard zoom that'll be perfect for a range of shooting environments.

## Lab Tests

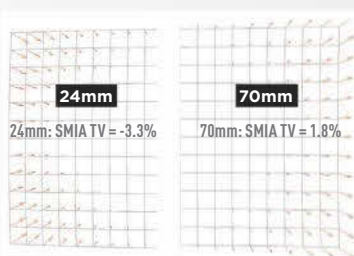
### RESOLUTION

At 24mm and f/2.8 centre sharpness is very good, but edge sharpness suffers. Best results are around f/8; results are still very good at f/11-f/16. Sharpness at 70mm is best in the centre at f/5.6.



### CURVILINEAR DISTORTION

At 24mm there's some visible barrel distortion. This disappears as you progress through the zoom range, with moderate pincushion distortion at 35mm that increases as you extend to 70mm.



### KEY SPECS

**FILTER DIAMETER** 82mm  
**LENS ELEMENTS** 20  
**GROUPS** 16  
**DIAPHRAGM**  
**BLADES** 9  
**APERTURE** f/2.8-f/22  
**MINIMUM FOCUS** 0.38-0.41m  
**LENGTH** 154.5mm  
**DIAMETER** 88mm  
**WEIGHT** 1,070g  
**LENS MOUNT** Nikon F

### PROS

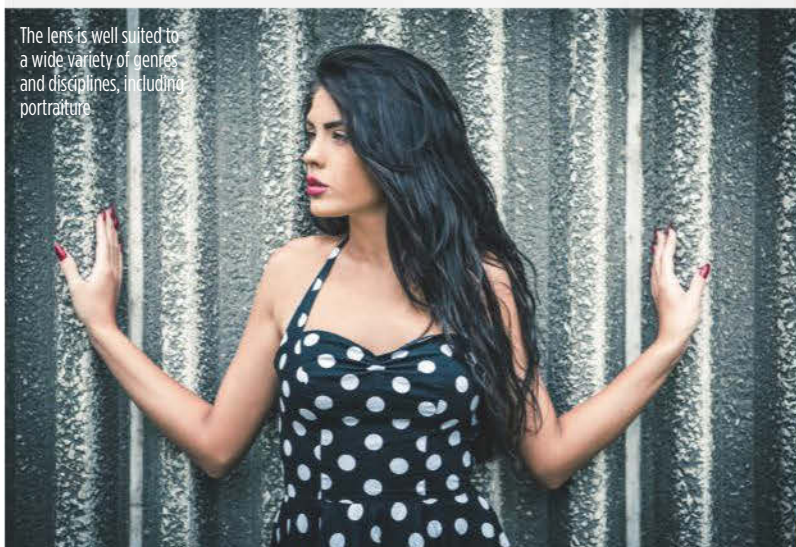
- Image quality
- VR performance
- Build quality
- AF speed

### CONS

- Price
- Vignetting wide open



WDC  
RATING



The lens is well suited to a wide variety of genres and disciplines, including portraiture

# Compact or System camera?

Which camera type is best for you? A simple compact that fits in a pocket, a premium or travel compact that's more advanced, or a system camera that has interchangeable lenses and more user control, such as a CSC or DSLR? We help you decide...

All digital cameras are based around the same theory; use a light-sensitive sensor to capture light, then process the result and save it onto a memory card. Beyond that, the functionality can vary wildly from model to model, from touchscreen controls to HD video and wide-aperture lenses differentiating one model from another.

Digital cameras fit into three distinct categories: compact camera, Compact System Camera (CSC) and Digital Single Lens Reflex (DSLR) cameras. All three have sub-genres within them, but there are other obvious qualities which set them apart.

Compact cameras have a fixed lens, which can't be removed and changed. This means that the lens becomes a feature in itself, with some of them starting at a particularly wide focal length, or reaching out much further than others (or both), and others having

wide maximum apertures which prove their worth in low light and for controlling depth of field.

Manual controls, the ability to record HD video and a large, high-resolution display or viewfinder are just a few of

many other features that can be had when more money is spent.

Within the compact camera genre are the likes of bridge, or 'superzoom' models, which offer a far longer zoom lens and a body shape akin to that

of a DSLR, together with manual control over shutter speed and aperture. While they can be used more creatively than regular compacts, their small sensors (relative to DSLR and CSC cameras) place restrictions on

## Compact

Small camera, generally pocket sized, with non-removable zoom lenses. Designed for convenience more than image quality, though some premium models feature larger sensors and manual controls.



### PROS

Small, Affordable, No additional lenses required, Pocketable, Less intimidating to use than DSLRs

### CONS

No option to change lenses for specific purposes, Small sensors not suited to all conditions

## Bridge camera

Looks like a DSLR but is actually a compact with a high-magnification zoom lens in a DSLR-shaped body – usually incorporating a large hand-grip and often a viewfinder.



### PROS

Long zooms, All-in-one design, Manual controls

### CONS

Generally small sensors are no match to DSLR quality, Build quality can be more plasticky than a DSLR

## Jargon Buster

### Compact System Camera (CSC)

Cameras which offer interchangeable lenses while omitting the viewfinder and mirror box construction common to DSLR cameras. These include Sony's NEX series and Olympus's PEN range, as well as Nikon's 1 system and Samsung's NX line of models.

### Digital Single Lens Reflex (DSLR)

A digital SLR camera, which is constructed around a mirror-box and pentamirror/pentaprism assembly, such as the Canon EOS 700D and Nikon D5300. These are popular among beginners, enthusiasts and

professionals, thanks to their wide compatibility with different lenses, manual control over exposure and ergonomics.

### Compact camera

A small camera whose lens cannot be removed, in contrast to interchangeable-lens cameras such as DSLRs. These are often cheaper than CSC and DSLR cameras, although they usually have more limited functionality and smaller sensors.

### Aperture

The aperture of a lens refers to the size of its opening which allows light through to the camera. This is created by a series of

blades inside the optic, and is usually regulated through the camera body, although some older lenses have physical aperture rings around their barrels. An aperture of f/2 or f/2.8 is classed as being large (or wide) because the opening itself is larger than those created by higher-number apertures such as f/16 or f/22.

### Shutter speed

The length of time that the shutter inside the camera is open, exposing the sensor to light. Longer shutter speeds let in more light, and so are often required in low-light conditions, or when the intention is to blur certain elements in the scene. Faster shutter

speeds are ideal for freezing motion, such as when photographing sports.

### Display

The rear panel on the back of a camera which shows captured images and videos, as well as the live feed from the sensor. These are usually TFT LCD types, although some cameras now make use of Organic Light Emitting Diode (OLED) alternatives. Resolution is usually specified in dots: compact camera displays often have 230k or 460k dots, while those displays that are on high-end enthusiast compacts, CSCs and DSLRs are usually 921k dots or even higher.



the kind of image quality that can be achieved.

## CSCs

CSCs fit somewhere between compacts and DSLRs, with the benefit of a small-format body and interchangeable lenses. Due to their mirrorless designs, optical viewfinders are exchanged for electronic variants that continue to get better all the time in terms of their resolution and sharpness.

Due to the lack of an established form factor, unlike DSLRs, CSCs come in a wide variety of shapes and sizes. Most differences are aesthetic, but a fair few affect the handling quite significantly too. Some models have thin, wide bodies, while others are shaped like DSLRs to provide more to wrap your hand around.

## DSLRs

DSLRs range from beginner models, such as the Canon EOS 1100D, up to professional level models, such as the same company's EOS-1D X. The body shape is similar throughout, with a large hand grip and dials on the top, although most professional DSLRs are more square than rectangular, with additional shutter release buttons and dials to make portrait-orientation shooting comfortable.

The addition of an optical viewfinder is one of the unique features that differentiates a

## CSC

An interchangeable-lens camera with no optical viewing assembly but either an electronic one, or just the LCD screen to shoot with. CSCs come in a wide variety of forms with a wide range of sensor sizes, so image quality varies greatly between models.



### PROS

Typically smaller than DSLRs, HD video, Interchangeable lenses, Great image quality for the size

### CONS

Optical viewfinders usually not available, Lens ranges, Premium models can be expensive

## DSLR

The choice of professionals, a DSLR features interchangeable lenses, plus an optical viewfinder that sees what the lens sees thanks to a 45° mirror and prism assembly inside the camera. The bulkiest camera type, but the full frame models deliver the highest image quality.



### PROS

Interchangeable lenses, Manual exposure control, HD video, Excellent ergonomics

### CONS

Large and heavy bodies, Expensive, Poor-quality kit lenses often supplied as standard

DSLR model from most CSCs and compact cameras.

The only models that buck this trend, and as a result can't quite be described as true DSLRs, are those in the Sony SLT range, whose models include the A58 and A77. The SLT construction uses a translucent mirror which means it does not need to move in order for light to pass through to the sensor, in contrast to DSLRs which flip their mirrors up at the point of exposure. As a result the burst rate is faster; with the likes of the A77 able to shoot at up to 12fps. The disadvantage, depending on

your preference, is the presence of an electronic, rather than optical, viewfinder.

There are essentially two kinds of sensor used in DSLRs: APS-C and full frame, although full frame sensors are starting to creep into some CSCs such as the Sony Alpha 7 and 7R.

Full frame is described as such because it's roughly the same size as a 35mm negative. APS-C sensors are smaller, and as a result they only use the central part of a lens, which in turn increases their effective focal length (reducing the angle of view). This is known as a 'crop factor'. Full frame lenses

do not apply a crop factor to lenses, and so they maintain the same angle of view and focal length as if they were used on a film SLR.

DSLRs and CSCs also attract the attention of videographers, given the proliferation of HD video functionality and the range of lenses available. Many DSLRs – particularly those aimed towards a more discerning audience – also now incorporate ports for external microphones and have a full complement of options for different frame rates and output options as well as control over audio recording.

### Optical viewfinder

A viewfinder which relies on an optical, rather than electronic, construction. DSLRs are equipped with optical viewfinders, which present the view through the lens. Those on cheaper DSLRs are constructed with a hollow chamber with mirrored sides (penta-mirrors) while those on pricier models feature a ground glass prism (pentaprism) which is brighter.

### Electronic viewfinder (EVF)

An electronic alternative to an optical viewfinder. These are typically integrated into bridge cameras and some Compact System Cameras, where an optical

viewfinder is either not possible or less desirable. More recent EVFs are constructed from OLED panels rather than LCDs, and some of these are surprisingly detailed and bright.

### Sensor size

The physical size of the sensor inside a camera. Cameras with larger sensors often produce better-quality images than those with smaller ones, as each photosite is larger. A larger capacity allows its signal-to-noise ratio to be higher; as a result images stand a better chance of having a wider dynamic range and of being less affected by noise.

### ISO

Also known as 'sensitivity', the ISO range of a camera determines its latitude for capturing images in different conditions. For a given camera, images captured at lower sensitivities generally contain less noise than those captured higher up, as the signal from the sensor – which contains unwanted noise – requires less amplification.

### Burstrate

The speed at which a camera can fire consecutive frames, given in frames per second (fps). Many recent cameras have a standard fps rate which captures at the sensor's full resolution, with further faster

options which output images at a reduced pixel count. Often a camera's fastest burst mode will only be possible with focus and exposure taken from the first frame.

### Neutral Density (ND) filter

ND filters are commonly used with DSLR cameras, although some enthusiast compacts now have these integrated into their lenses. Their purpose is to reduce exposure times, so that longer shutter speeds can be used, with the 'neutral' part of their name signifying that they are designed to have no effect on the colour balance of an image.

# Camera Listings

If you want maximum control over your creative shooting options, you want an interchangeable-lens camera, whether a DSLR model or a Compact System Camera model. Here we list and rate all the models on the market

## DSLRs

DSLRs										Stereo mic input	AF Points	Burst mode (FPS)	Viewfinder (%)	Built-in Wi-Fi	Built-in GPS	Flash	Articulated LCD	Touchscreen	Battery life (Shots)	Width (mm)	Height (mm)	Depth (mm)	Weight
NAME & MODEL	RRP	TESTED	SCORE	SUMMARY	SENSOR	LENS	MAX ISO	VIDEO	SHOOTING				SCREEN		DIMENSIONS								
Canon EOS 1200D	£450	06/14	4★	Entry level update to Canon's 1100D, the 1200D excels in the key areas of AF speed and accuracy while ISO performance is good	16MP	Canon	12,800	1080p	9	3	95		•	3in		500	129.6	99.7	78	480g			
Pentax K-500	£450	10/13	4★	Stripped-down version of K-500 without weather sealing boasts 100% glass prism viewfinder; uses AA batteries	16.3MP	Pentax	51,600	1080p	11	6	100		•	3in		410	130	97	71	646g			
Sony Alpha 58	£450	07/13	4★	Replacement for A57 boasts Bionz image processing engine, OLED viewfinder, plus 20MP sensor – up from 16MP	20.1MP	Sony	16,000	1080p	15	5	100		•	2.7in	•	690	129	95.5	78	492g			
Pentax K-S1	£550	03/15	4★	The fully-specified K-S1 boasts excellent image quality, while still being a lightweight, compact and portable option	12.1MP	Pentax	51,200	1080p	•	11	54	100		•	3in		tbc	92.5	120	69.5	498g		
Canon EOS 750D	£599	08/15	4★	A new addition to the EOS line-up, the 750D is designed for EOS newcomers, with a non-threatening layout	24.2MP	Canon	25,600	1080p	19	5	95	•		•	3in	•	•	440	131.9	100.7	77.8	555g	
Nikon D3300	£600	04/14	4.5★	Nikon's new entry-level DSLR is smaller than previous offerings while a sensor with no anti-aliasing filter means detail is high	24.2MP	Nikon	25,600	1080p	•	11	5	95		•	3in		700	124	98	75.5	460g		
Pentax K-30	£600	03/14	4★	Stellar image quality make this a welcome alternative to Canon, Nikon and Sony offerings at the price	16.3MP	Pentax	25,600	1080p	11	6	100		•	3in		410	96.5	128.5	71.5	660g			
Pentax K-50	£600	10/13	4.5★	Replacement for K-30 offers 16MP sensor, weather sealing and improved processing. Still able to shoot at up to 6fps	16.3MP	Pentax	51,200	1080p	11	4	100		•	3in		410	130	97	71	650g			
Canon EOS 760D	£649	10/15	5★	A new addition to the EOS line-up, the 760D leans towards the aspiring enthusiast photographer	24.2MP	Canon	25,600	1080p	19	5	100	•		•	3in	•	•	440	131.9	101	77.8	565g	
Pentax K-S2	£649	Web	4.5★	Pentax's latest mid-range DSLR continues its tradition of offering affordable yet well-specified cameras	20.2MP	Pentax	51,200	1080p	•	11	54	100	•		•	3in	•	410	122.5	91	72.5	678g	
Nikon D3200	£650	07/12	4.5★	With a 24MP sensor and excellent Guide mode, this is the perfect entry-level DSLR. Wi-Fi & GPS optional	24.2MP	Nikon	12,800	1080p	•	11	4	95		•	3in		540	125	96	76	505g		
Canon EOS 100D	£650	07/13	4.5★	Billed as the world's smallest and lightest DSLR; kit lens is the company's EF-S 18-55 f/3.5-5.6 IS STM zoom. GPS optional	18MP	Canon	12,800	1080p	•	9	4	95		•	3in		380	117	91	69	407g		
Nikon D5200	£720	03/13	4.5★	Inspired by the D5100 and D7000, the D5200 has a vari-angle LCD, 24MP sensor and HD video. Wi-Fi & GPS optional	24.1MP	Nikon	25,600	1080p	•	39	5	95		•	3in	•	n/a	129	98	78	555g		
Nikon D5500	£720	04/15	4.5★	New DX-format DSLR in Nikon's 'advanced beginner' range, updating the impressive D5300 and adding a touchscreen	24.2MP	Nikon	25,600	1080p	•	39	5	95	•		•	3.2in		820	124	97	70	470g	
Canon EOS 60D	£750	09/12	4.5★	Still current in the company's DSLR range, this semi-pro design packs in an 18MP CMOS sensor and a vari-angle screen	18MP	Canon	25,600	1080p	•	9	5	96			3in	•	1,100	145	106	79	755g		
Canon EOS 700D	£750	Web	4.5★	Update to 650D comes bundled with a new 18-55mm STM kit lens, that promises improved movie AF. GPS & Eye-Fi optional	18MP	Canon	12,800	1080p	•	9	5	95		•	3in	•	440	133	100	79	580g		
Pentax K-3 II	£769	Web	4.5★	Ricoh has updated the Pentax K-3 with the K-3 II. The K-3 II is designed to be the flagship Pentax APS-C DSLR	24.3MP	Pentax	51,200	1080p	•	27	8.3	100	•		•	3.2in		tbc	131.5	102.5	77.5	785g	
Sony Alpha 65	£790	02/12	4.5★	Featuring the same sensor as the A77, the A65 can rattle off 10 frames per second and has a crisp electronic viewfinder	24.3MP	Sony	16,000	1080p	•	15	10	100	•	•	3in		440	132	98	81	543g		
Nikon D5300	£830	01/14	4.5★	Update on the D5200 with large sensor, larger screen, HD video, and long lasting battery, should appeal to videographers	24.2MP	Nikon F	25,600	1080p	•	23	5	95	•	•	•	3.2in	•	700	125	98	76	530g	
Pentax K-5 II	£870	03/13	4.5★	Latest update to K-5 promises improved AF performance in low light and subject tracking with moving subjects	16.3MP	Pentax	51,200	1080p	•	11	7	100		•	3in		980	131	97	73	760g		
Nikon D7200	£939	06/13	4★	Nikon's latest mid-range DSLR offers impressive new features over the D7100 it replaces at the top of Nikon's DX format range	24.2MP	Nikon F	25,600	1080p	•	51	6	100	•		•	3.2in		1,100	135.5	106.5	76	765g	
Pentax K-3	£950	01/14	4★	Upgrade from Pentax K-5. GPS optional. Impersonates a low pass filter. High FPS rate and is the first to carry Ricoh's name	24.2MP	Pentax	51,200	1080i	•	27	8	100		•	•	3.2in		560	131	100	77	800g	
Sony Alpha 77 MkII	£1000	09/14	4.5★	With the mkII Sony has brought built-in Wi-Fi, great handling and an enhanced AF that will suit sports and wildlife shooters	24.3MP	Sony	25,600	1080p	•	79	12	100	•		•	3in	•	480	142.6	104	81	647g	
Nikon D7000	£1100	01/11	4.5★	A semi-pro DSLR offering some fantastic features and which still has everything an aspiring photographer would need	16MP	Nikon	25,600	1080p	•	39	6	100		•	3in		1,050	132	105	77	690g		
Canon EOS 70D	£1100	11/13	4.5★	World's first DSLR to boast Dual Pixel CMOS AF technology, giving the best autofocus performance for a DSLR during live view	20.2MP	Canon	12,800	1080p	•	19	7	98	•		•	3in	•	920	139	104	79	755g	
Nikon D7100	£1100	05/13	4.5★	The D7100 updates the D7000 in several significant ways, and while not without fault it's still praiseworthy. Wi-Fi optional	24.1MP	Nikon	25,600	1080p	•	51	6	100		•	3in		950	135	106	76	765g		
Canon EOS 7D MkII	£1599	01/15	4.5★	A better sensor and improved AF over the 7D; this is one of the best APS-C DSLRs for enthusiasts and pros. Wi-Fi optional	20.2MP	Canon	51,200	1080p	•	65	10	100		•	3in		670	148.6	112.4	78.2	910g		
Canon EOS 6D	£1700	02/13	4.5★	Superb image quality from Canon's latest – and cheapest – full-frame DSLR. Also offers Wi-Fi and GPS connectivity	20.2MP	Canon	102,400	1080p	•	11	4.5	97	•	•	3in		980	145	111	71	755g		
Nikon D610	£1800	12/13	5★	Upgrade from D600: improved auto white balance, faster continuous shooting and a quiet continuous mode. GPS optional	24.3MP	Nikon	25,600	1080p	•	39	6	100		•	3.2in	•	900	141	113	82	850g		
Sony Alpha 99	£1800	Xmas12	4★	Sony's full-frame A99 offers translucent mirror technology allied to a 19-point AF system with 11 cross sensors	24.3MP	Sony	25,600	1080p	•	19	10	100		•	3in	•	500	147	111	78	812g		
Nikon D750	£1800	12/14	5★	The D750 is one of the very best all-round enthusiast DSLRs currently available, with an impressive performance	24.3MP	Nikon	51,200	1080p	•	51	6.5	100	•		•	3.2in	•	1,230	140.5	113	78	840g	
Nikon D800	£2600	06/12	5★	Offering a massive 36MP, this is the camera to go for if you want to produce ultra-large prints. GPS optional	36.3MP	Nikon	25,600	1080p	•	51	4	100		•	3.2in		900	146	123	81	900g		
Nikon DF	£2600	02/14	4★	Nikon's retro-tinged full-frame DSLR has a solid spec although it lacks a video mode. Overall, its images are superb	16.2MP	Nikon	204,800	-	39	5.5	100			3.2in		1,400	143.5	110	66.5	765g			
Nikon D810	£2699	11/14	5★	Replacing the D800 and D800E, the D810 is a truly welcome upgrade and one of the very best DSLRs on the market	36.3MP	Nikon	51,200	1080p	•	51	12	100		•	3.2in		1,200	146	123	82	980g		
Nikon D800E	£2600	08/12	4.5★	Removes the anti-aliasing filter of the D800 for even greater detail should you need it. GPS optional	36.3MP	Nikon	25,600	1080p	•	51	4	100		•	3.2in		900	146	123	81	900g		
Canon EOS 5D Mk III	£2999	06/12	5★	An excellent full frame sensor, fast burst rate, high ISO range and advanced AF make this an impressive piece of kit. Wi-Fi optional	22.3MP	Canon	102,400	1080p	•	61	6	100		3.2in		950	152	116	76	950g			
Canon EOS 5DS	£2999	NYT		New full-frame DSLR that builds on the great success of its EOS 5D Mark III, which sports a world-first 50.6MP full frame sensor	50.6 MP	Canon	12,800	1080p	•	61	5	100		3.2in		700	152	116.4	76.4	845g			
Canon EOS 5DS R	£3199	09/15	5★	New 50MP full-frame DSLR, identical to the 5DS it was launched with except that it forgoes an optical low-pass filter	50.6 MP	Canon	12,800	1080p	•	61	5	100		3.2in		700	152	116.4	76.4	845g			
Nikon D4S	£5290	Web	5★	Nikon's flagship DSLR, the D4S takes the best features of the D4 and improved the burst speed, AF and processing power	16.2MP	Nikon	409,600	1080p	•	51	11	100		3.2in		3,020	160	156.5	90.5	1,300g			
Canon EOS-1D X	£5300	11/12	5★	A contender for the crown of best DSLR on the market, this camera is hard to fault. GPS & Wi-Fi optional	18.1MP	Canon	204,800	1080p	•	61	12	100		3.2in		1,120	158	163	82	1,100g			



## COMPACT SYSTEM CAMERAS

Compact System Cameras									Stereo mic input	Shooting				Screen		Touchscreen	Battery life (shots)	Dimensions				
Name & Model	RRP	Tested	Score	Summary	Sensor	Lens	Max ISO	Video	AF Points	Burst (FPS)	Viewfinder	Built-in Wi-Fi	Built-in GPS	Flash				Width (mm)	Height (mm)	Depth (mm)	Weight	
Sony Alpha 3000	£350	12/13	2.5★	Compact, affordable, and delivers DSLR-style results	20.1MP	Sony E	16,000	1080p	25	3.5	•			•	3in			480	128	91	84.5	353g
Samsung NX3000	£350	10/14	4★	This may well be the best-value NX camera yet	20.3MP	Samsung	25,600	1080p	21	5		•			3in	•		370	117.4	66	39	266g
Panasonic Lumix GF6	£400	Web	4★	Newly developed Venus Engine and a 180° tilt screen	16MP	Mic4/3	25,600	1080p	•	23	20		•		3in	•	•	340	111	65	38	323g
Pentax Q7	£400	11/13	3★	Extra large sensor and improved AF	12.4MP	Pentax	12,800	1080p	25	5				•	3in			250	102	58	34	200g
Samsung NX Mini	£400	Web	4★	The light and compact NX Mini is very impressive	21MP	Samsung	25,600	1080p	35	6		•			3in	•		530	119	62	22.5	196g
Sony Alpha 5000	£420	Web	4★	Aims to compete with entry-level DSLRs	20.1MP	Sony	16,000	1080p	•	25	3.5		•		3in	•		420	110	63	36	296g
Nikon 1 S1	£480	Web	4★	User-friendly with an uncluttered interface	10.1MP	Nikon 1	6400	1080p	135	60		•			3in			220	102	61	30	197g
Olympus PEN E-PL5	£480	02/13	4★	One of the most competent CSCs at the price	16MP	Mic4/3	12,800	1080p	•	23	20		•		3in	•	•	360	110	64	34	261g
Olympus PEN E-PL7	£499	01/15	4★	High spec, compact size and superb image quality	16MP	Mic4/3	25,600	1080p	81	8		•		•	3in			350	114.9	67	38.4	357g
Nikon 1 J4	£499	11/14	4★	Excellent shooting speed and AF performance	18.4MP	Nikkor 1	12,800	1080p	•	171	20				3in	•		300	99.5	60	28.5	192g
Fujifilm X-T10	£499	09/15	4.5★	A more affordable version of the popular X-T1	16.3MP	Fuji X	51,200	1080p	•	77	8		•	•	3in	•		350	118.4	82.8	40.8	381g
Fujifilm X-A1	£500	12/13	4★	Virtually identical to X-M1, but with a standard sensor	16.3MP	Fuji X	25,600	1080p	41	5.6		•		•	3in	•		350	117	66.5	39	330g
Samsung NX300	£530	06/13	4.5★	Company adds to its range of Wi-Fi-enabled cameras	20.3MP	Samsung	25,600	1080p	105	8.6		•	•		3.3in	•	•	320	122	64	41	284g
Nikon 1 J3	£540	Web	3★	Boasts a 14.2MP sensor from range-topping V2	14.2MP	Nikon 1	6400	1080p	135	60				•	3in			220	101	61	29	244g
Sony NEX-5T	£540	01/14	4★	APS-C sensor delivers DSLR results	16.1MP	Sony E	25,600	1080p	25	3		•		•	3in	•	•	330	111	59	39	276g
Sony Alpha 5100	£549	12/14	4★	One of the very best in class, in video and image quality	24MP	Sony E	25,600	1080p	179	6		•		•	3in	•	•	400	110	63	36	283g
Panasonic Lumix G6	£550	07/13	4.5★	DSLR-like performance and images	16MP	Mic4/3	25,600	1080p	•	23	7		•		3in	•	•	n/a	122	85	72	340g
Canon EOS M3	£599	07/15	4★	The M3 looks set to appeal to enthusiast photographers	24.3MP	Canon M	25,600	1080p	•	49	4.2		•		3in	•	•	250	110.9	68	44.4	366g
Panasonic Lumix GM1	£629	01/14	4.5★	Tiny, retro compact design is impressive	16MP	Mic4/3	25,600	1080p	23	5		•		•	3in	•		230	99	55	30	204g
Sony Alpha 6000	£670	06/14	4.5★	Class-leading AF and an impressive APS-C sensor	24MP	Sony	25,600	1080p	179	11		•		•	3in	•		310	120	67	45	344g
Panasonic Lumix G7	£679	08/15	4★	The G7 is Panasonic's fifth model to have video capture	16MP	Mic4/3	25,600	3840p		8		•		•	3in	•	•	360	124.9	86.2	77.4	
Fujifilm X-M1	£680	10/13	4★	Company's third CSC features X-mount lens mount	16.3MP	Fuji X	6400	1080p	54	5.6		•		•	3in	•		350	117	67	39	330g
Olympus OM-D E-M10	£699	05/14	4.5★	Maintains the high-end features of its OM-D siblings	16MP	Mic4/3	25,600	1080p	•	81	8		•		3in	•		320	119	82	46	396g
Canon EOS M	£700	XMAS12	4.5★	Shares much of its functionality with the EOS 650D DSLR	18MP	Canon M	25,600	1080p	31	4.3		•		•	3in	•		230	109	66.5	32	298g
Panasonic Lumix GM5	£749	01/15	4★	Small CSC with an electronic viewfinder	16MP	Mic4/3	25,600	1080p	•	23	5.8		•		3in	•		210	98.5	59.5	36	211g
Nikon 1 AW1	£749	12/13	3.5★	High-end CSC is waterproof and shockproof	14.2MP	Nikon 1	6400	1080p	41	15		•	•	•	3in			220	113	71.5	37.5	356g
Nikon 1 V2	£800	02/13	3.5★	Revamp for V1. Price includes 10-30mm kit lens	14.2MP	Nikon 1	6400	1080p	•	73	15			•	3in			n/a	109	82	46	277g
Sony NEX-6	£800	01/13	4★	Excellent EVF and fast operation	16.1MP	Sony E	25,600	1080p	•	25	10		•		3in	•		360	120	67	43	287g
Olympus OM-D E-M5 mkl	£900	05/15	5★	Olympus's latest premium CSC boasts several improvements	16MP	Mic4/3	25,600	1080p	•	81	10		•		3in	•		750	123.7	85	44.5	469g
Panasonic Lumix GX7	£900	10/13	4.5★	With fast AF and tiltable EVF, delivers excellent results	16MP	Lumix G	25,600	1080p	23	40		•		•	3in	•	•	n/a	122.6	70.7	43.3	402g
Olympus PEN E-P5	£900	09/13	4.5★	No built-in EVF but has fast AF plus high quality images	16MP	Mic4/3	25,600	1080p	35	9		•	•	•	3in	•	•	330	122	69	37	420g
Samsung NX30	£900	Web only	4.5★	A DSLR-style CSC with a burst rate of up to 8fps	21MP	Samsung	25,600	1080p	•	247	8		•	•	3in	•		360	127	96	58	375g
Panasonic Lumix GX8	£1000	10/15	4★	The highest resolution Micro Four Thirds camera yet	20.3MP	Mic4/3	25,600	3840p	•	49	8		•		3in	•	•	330	133.2	78	63.1	487g
Fujifilm X-T1	£1100	4/12	5★	One of the best premium CSCs on the market	16.3MP	Fuji X	51,200	1080p	•	49	8			•	3in	•		350	129	89.8	46.7	440g
Panasonic Lumix GH3	£1120	XMAS12	5★	Responsive touchscreen and superb video mode	16MP	Mic4/3	25,600	1080p	•	23	6		•		3in	•	•	540	133	93.4	82	470g
Fujifilm X-E1	£1149	01/13	4.5★	Solid build, retro design and high image quality	16MP	Fuji X	25,600	1080p	49	6		•		•	3in			350	129	75	38	350g
Olympus OM-D E-M5	£1150	5/12	4.5★	The re-imagining of the classic Olympus OM	16MP	Mic4/3	25,600	1080p	•	35	9		•		3in	•	•	tbc	121	89.6	41.9	373g
Fujifilm X-E2	£1200	02/14	4.5★	Has over 60 improvements on the X-E1	16.3MP	Fuji X	25,600	1080p	•	49	7		•		3in			350	129	75	37	350g
Samsung NX1	£1299	02/15	5★	The first camera with an APS-C BSI sensor is impressive	28.2MP	Samsung	25,600	4096p	•	205	15		•	•	3in	•		tbc	138.5	102.3	65.8	550g
Panasonic Lumix GH4	£1300	07/14	4★	Both 4K video quality and still images are impressive	16MP	Mic4/3	25,600	4096p	•	49	12		•		3in	•	•	500	133	93	84	560g
Samsung Galaxy NX	£1300	10/13	4★	World's first 3G/4G Android CSC	20.3MP	Samsung	25,600	1080p	•	105	8.6		•	•	4.8in	•		-	137	101	26	495g
Olympus OM-D E-M1	£1300	12/13	5★	Fully weather-proofed and Wi-Fi enabled	16.8MP	Mic4/3	25600	1080p	•	81	10		•		3in	•	•	330	130	93.5	63	497g
Sony Alpha 7	£1300	01/14	4.5★	One of the lightest, smallest full-frame cameras	24.3MP	Sony E	25,600	1080p	•	117	5		•		3in	•		340	127	94	48	474g
Leica T	£1350	08/14	4★	Excellent image quality	16MP	Leica T	12,500	1080p	195	5		•		•	3.7in	•			134	69	33	384g
Fujifilm X-Pro1	£1430	05/12	5★	Offers innovations including a hybrid viewfinder	16MP	Fuji X	25,600	1080p		49	6		•		3in			300	139	81.8	42.5	450g
Sony Alpha 7 II	£1498	03/15	5★	The full-frame A7 II is at the top of Sony's CSC range	24.3MP	Sony E	25,600	1080p	•	117	5		•	•	3in			350	126.9	95.7	59.7	556g
Sony Alpha 7R	£1700	02/14	4.5★	One of the lightest, smallest full-frame cameras	36.4MP	Sony E	25,600	1080p	•	25	4		•		3in	•		340	127	94	48	465g
Sony Alpha 7S	£2099	09/14	4.5★	The Sony Alpha 7S is the latest Sony full-frame CSC	12.4MP	Sony E	409,600	1080p	•	25	5		•		3in	•		380	127	94.4	48.2	489g
Sony Alpha 7R II	£2599	11/15	5★	A big step up from the A7R; one of the best CSCs available	42.4MP	Sony E	102,400	3840p	•	399	5		•	•	3in	•		290	126.9	95.7	60.3	625g

# Lens Listings

A DSLR or Compact System Camera is hugely affected by the lens attached to the front, as the light hitting the sensor impacts focus, exposure and image quality. Cast your eyes over our lens listings to find out which is best for you before you make a purchase

## BUILT-IN FOCUS MOTOR

Some lenses incorporate a motor within the lens to drive the autofocus, while others are powered by motors within the camera. The former will focus quicker than the latter. Canon lens motors are USM (Ultrasonic Motor), Sigma HSM (Hypersonic-Motor).

### 35mm Compatibility

Most digital sensors are smaller than 35mm, which is why lenses designed for digital can be smaller.

## LENS MOUNTS

Each manufacturer has its own lens mount and most aren't compatible with one another. For example, a Canon DSLR can't use Nikon lenses, though you can use independent brands if you get them with the right mount.

## FILTER THREAD

In order to correct for colour casts or create more contrast, a screw-in filter can be used. The thread at the front of the camera will have a diameter, in mm, which will allow you to attach a variety of filters or adapters to the lens.

## MAGNIFICATION FACTOR

If you're changing from a 35mm SLR, your lenses won't provide the same field of view on a DSLR unless you have a "full-frame" model. So for Nikon, Pentax and Sony DSLRs, magnify the focal length by 1.5x to get a 35mm equivalent; for Canon 1.6x and Sigma 1.7x.



## Lens types explained



### Fixed focal length (PRIME)

Fixed lenses offer wider maximum apertures and superior image quality. A 50mm lens is perfect for low light, 85-105mm is ideal for portraits, while a 300mm+ tele is for sports shooters.



### Telephoto zoom

Telephotos are great for sport and wildlife, while short teles are good for portraits. Telephoto lenses magnify camera shake, so look for one with Image Stabilisation to ensure you achieve the sharpest shots possible.



### Standard zoom

Most DSLRs come with a standard zoom which spans from moderate wideangle to short telephoto. These 'kit' lenses are fine for most purposes, but there are alternatives that offer superior image quality.



### Superzooms

While they rarely compare with shorter lenses in image quality, a superzoom offers convenience. Great for travelling when you're conscious of weight, don't expect pin-sharp, aberration-free images.



### Wideangle zoom

Wideangle lenses make subjects seem further away, enabling you to get more into the shot – perfect for landscapes and architecture. The most popular wideangle zooms are the 10-20mm and 12-24mm ranges.



### Macro lenses

A true macro lens lets you reproduce your subject at life-size (1:1) or half life-size (1:2) on the sensor. Macro lenses come in various focal lengths and extension tubes can offer a greater magnification.

## LENS SUFFIX GUIDE USED BY MANUFACTURERS

<b>AD</b> Tamron Anomalous Dispersion elements	<b>DG</b> Sigma's designation for all lenses	<b>FE</b> Tokina floating element lenses	<b>N</b> Nikon's Nano Crystal Coating	<b>SWD</b> Olympus Supersonic Wave Drive
<b>AF-DC</b> Nikon defocus feature	<b>DI</b> Tamron lenses for full-frame sensors	<b>G</b> Nikon lenses without an aperture ring	<b>OS</b> Sigma's Optically Stabilised lenses	<b>SWM</b> Nikon lenses with a Silent Wave Motor
<b>AF-S</b> Nikon lenses with Silent Wave Motor	<b>DI-II</b> Tamron lenses designed for APS-C	<b>HF</b> Sigma Helical Focusing	<b>PRO</b> Tokina's Professional range of lenses	<b>TS-E</b> Canon Tilt and Shift lens
<b>APO</b> Sigma Apochromatic lenses	<b>DO</b> Canon diffractive optical element lenses	<b>HID</b> Tamron's High Index Dispersion glass	<b>RF</b> Sigma & Nikon Rear Focusing	<b>UD</b> Canon Ultra Low Dispersion glass
<b>ASP</b> Tamron lenses featuring aspherical elements	<b>DT</b> Sony lenses for APS-C sized sensors	<b>HLD</b> Tokina low dispersion glass	<b>SD</b> Tokina's Super Low Dispersion element	<b>USM</b> Canon lenses with an Ultrasonic Motor
<b>ASL</b> Sigma lenses featuring aspherical elements	<b>DX</b> Nikon's designation for digital lenses	<b>HSM</b> Sigma's Hypersonic Motor	<b>SDM</b> Pentax's Sonic Direct Drive Motor	<b>VC</b> Tamron's Vibration Compensation
<b>AT-X</b> Tokina's Advanced Technology Extra Pro	<b>ED</b> Low Dispersion elements	<b>IF</b> Internal Focusing	<b>SF</b> Canon lenses with Softfocus feature	<b>VR</b> Nikon's Vibration Reduction feature
<b>CRC</b> Nikon's Close Range Correction system	<b>EF</b> Canon's full-frame lenses	<b>IRF</b> Tokina's Internal Rear Focusing lenses	<b>SHM</b> Tamron's Super Hybrid Mount	<b>XR</b> Tamron Extra Refractive Index glass
<b>D</b> Nikon lenses that communicate distance info	<b>EF-S</b> Canon lenses for APS-C sized sensors	<b>IS</b> Canon's Image Stabilised lenses	<b>SIC</b> Nikon's Super Integrated Coating	<b>ZL</b> Tamron's Zoom Lock feature
<b>DA</b> Pentax lenses optimised for APS-C sized sensors	<b>EX</b> Sigma's 'Excellent' range	<b>L</b> Canon's 'Luxury' range of lenses	<b>SLD</b> Sigma Super Low Dispersion elements	
<b>DC</b> Sigma's designation for digital lenses	<b>FC</b> Tokina's Focus Clutch Mechanism	<b>LD</b> Tamron Low Dispersion glass	<b>SP</b> Tamron's Super Performance range	
<b>DF</b> Sigma lenses with dual focus facility	<b>FE</b> Canon's fisheye lenses	<b>M-OIS</b> Mega Optical Image Stabilisation	<b>SSM</b> Sony/Minolta Supersonic Motor lenses	



CANON					Image Stabilisation	Mount	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY							
EF 8-15mm f/4 L USM	£1499	NYT		Impressive-looking fisheye zoom lens from Canon			15	n/a	78.5	83	540g
EF-S 10-18mm f/4.5-5.6 IS STM	£299	11/14	4★	A superb ultra wideangle that's a must-have for anyone shooting landscapes and cityscapes	•	•	22	67	74.6	72	240g
EF-S 10-22mm f/3.5-4.5 USM	£990	9/09	4★	A good performer, with solid MTF curves and minimal chromatic aberration	•	•	24	77	83.5	89.8	385g
EF 11-24mm f/4L USM	£2799	NYT		Long-awaited by Canon full-frame users, this is the world's widest-angle rectilinear zoom lens	•	•	28	n/a	108	132	1180g
EF 14mm f/2.8 L II USM	£2810	7/10	4.5★	Impressive resolution at f/8 but less so wide open	•	•	20	n/a	80	94	645g
EF-S 15-85mm f/3.5-5.6 IS USM	£900	3/11	4★	4-stop image stabilisation and Super Spectra coatings, together with a useful range	•	•	35	72	81.6	87.5	575g
EF 16-35mm f/2.8 L II USM	£1790	6/10	4.5★	Mark II of above lens, and a good performer with strong results at f/8 in particular	•	•	28	82	88.5	111.6	635g
EF 16-35mm f/4L IS USM	£1199	9/14	4★	Versatile and with a useful IS system, this is a very good ultra-wideangle zoom for full frame cameras	•	•	28	77	82.6	112.8	615g
TS-E 17mm f/4 L	£2920	NYT		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings	•	•	25	77	88.9	106.9	820g
EF 17-40mm f/4 L USM	£940	11/08	4★	Designed to match the needs of demanding professionals – and does so with ease	•	•	28	77	83.5	96.8	500g
EF-S 17-55mm f/2.8 IS USM	£795	2/13	4★	Very capable lens with three-stop image stabilisation, Super Spectra coating and a circular aperture	•	•	35	77	83.5	110.6	645g
EF-S 17-85mm f/4-5.6 IS USM	£600	11/08	3★	Doesn't really live up to its promises. The zoom range is excellent but there are better alternatives	•	•	35	67	78.5	92	475g
EF-S 18-55mm f/3.5-5.6 IS II	£220	11/08	3.5★	Given the low price of this zoom, its results are very impressive	•	•	25	58	68.5	70	200g
EF-S 18-135mm f/3.5-5.6 IS	£500	NYT		4-stop image stabilisation and automatic panning and tripod detection	•	•	45	67	75.4	101	455g
EF-S 18-200mm f/3.5-5.6 IS	£740	10/11	4★	Automatic panning detection (for image stabilisation) and a useful 11x zoom range	•	•	45	72	78.6	102	595g
EF 20mm f/2.8 USM	£610	NYT		Wideangle lens with a floating rear focusing system and a USM motor	•	•	25	72	77.5	70.6	405g
EF 24mm f/1.4 L II USM	£2010	NYT		Subwavelength structure coating, together with UD and aspherical elements	•	•	25	77	93.5	86.9	650g
EF 24mm f/2.8 IS USM	£750	05/13	4★	Small wideangle optic with image stabilisation	•	•	25	58	67.5	48.5	270g
TS-E 24mm f/3.5 L II	£2550	NYT		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings	•	•	21	82	88.5	106.9	780g
EF 24-70mm f/2.8 L USM	£1540	7/09	4.5★	A solid performer with an excellent reputation that only years in the field can secure	•	•	38	77	83.2	123.5	950g
EF 24-70mm f/2.8 L II USM	£2300	XMAS 12	5★	Professional quality standard zoom lens with a fast aperture	•	•	38	82	88.5	113	805g
EF 24-70mm f/4 L IS USM	£1499	NYT		L-series zoom said to be compact, portable and aimed at both professionals and amateurs	•	•	38	77	83.4	93	600g
EF 24-105mm f/4 L IS USM	£1049	3/13	4.5★	An excellent all-round performer, and keenly priced too	•	•	45	77	83.5	107	670g
EF 24-105mm f/3.5-5.6 IS STM	£479	NYT		A versatile standard zoom lens that's an ideal route into full frame photography	•	•	40	77	83.4	104	525g
EF 28mm f/1.8 USM	£570	NYT		USM motor and an aspherical element, together with a wide maximum aperture	•	•	25	58	73.6	55.6	310g
EF 28mm f/2.8 IS USM	£730	05/13	3.5★	Lightweight and inexpensive lens, with a single aspherical element	•	•	30	52	67.4	42.5	185g
EF 28-135mm f/3.5-5.6 IS USM	£560	12/09	4.5★	Excellent optical performance, with the benefit of image stabilisation	•	•	50	72	78.4	96.8	540g
EF 28-300mm f/3.5-5.6 L IS USM	£3290	NYT		L-series optic with expansive range, image stabilisation and a circular aperture	•	•	70	77	92	184	1670g
EF 35mm f/2	£320	3/12	4.5★	A cut-price fixed focal length lens	•	•	25	52	67.4	42.5	210g
EF 35mm f/2 IS USM	£799	NYT		First 35mm prime from Canon to feature an optical stabilisation system	•	•	24	67	62.6	77.9	335g
EF 35mm f/1.4 L USM	£1720	NYT		L-series construction and a wide maximum aperture, with a ring-type USM	•	•	30	72	79	86	580g
EF 40mm f/2.8 STM	£230	NYT		A portable and versatile compact pancake lens. A fast maximum aperture enables low-light shooting	•	•	30	52	68.2	22.8	130g
EF 50mm f/1.2 L USM	£1910	NYT		Very wide maximum aperture and Super Spectra coatings, and a circular aperture	•	•	45	72	85.8	65.5	580g
EF 50mm f/1.4 USM	£450	2/10	5★	Brilliant performer, with a highly consistent set of MTF curves. AF motor is a tad noisy though	•	•	45	58	73.8	50.5	290g
EF 50mm f/1.8 STM	£130	09/15	5★	Lightest EF lens in the range, with wide maximum aperture and a Micro Motor	•	•	35	49	69.2	39.3	130g
EF 50mm f/2.5 Macro	£350	NYT		Compact macro lens with floating system	•	•	23	52	67.6	63	280g
EF-S 55-250mm f/4-5.6 IS II	£330	1/12	4★	Ideal budget addition to the 18-55mm kit lens, with image stabilisation and USM	•	•	110	58	70	108	390g
EF-S 60mm f/2.8 Macro USM	£540	8/06	4★	Great build and optical quality, with fast, accurate and near-silent focusing	•	•	20	52	73	69.8	335g
MP-E65 f/2.8 1-5x Macro	£1250	NYT		Macro lens designed to achieve a magnification greater than 1x without accessories	•	•	24	58	81	98	710g
EF 70-200mm f/2.8 L USM	£1540	NYT		Non-stabilised L-series optic, with rear focusing and four UD elements	•	•	150	77	84.6	193.6	1310g
EF 70-200mm f/4 L IS USM	£1450	11/11	5★	A superb option for the serious sports and action photographer	•	•	120	67	76	172	760g
EF 70-200mm f/2.8 L IS II USM	£2800	10/10	5★	A great lens but also a costly one. Peak resolution at 0.4 cycles-per-pixel is simply amazing	•	•	120	77	88.8	199	1490g
EF 70-200mm f/4 L USM	£790	NYT		A cheaper L-series alternative to the f/2.8 versions available	•	•	120	67	76	172	705g
EF 70-300mm f/4.5-5.6 IS USM	£470	11/10	4★	A great level of sharpness and only the small apertures should be avoided	•	•	150	58	76	143	630g
EF 70-300mm f/4-5.6 L IS USM	£1600	7/11	5★	An L-series lens with a highly durable outer shell	•	•	120	67	89	143	1050g
EF 70-300mm f/4.5-5.6 DO IS USM	£1700	NYT		3-layer diffractive optical element and image stabilisation	•	•	140	58	82.4	99.9	720g
EF 75-300mm f/4-5.6 III	£300	NYT		Essentially the same lens as the 75-300mm f/4.0-5.6 III USM but with no USM	•	•	150	58	71	122	480g
EF 75-300mm f/4-5.6 III USM	£350	9/07	2.5★	Good but not outstanding. The inclusion of a metal lens mount is positive, though	•	•	150	58	71	122	480g
EF 85mm f/1.2 L II USM	£2640	8/06	4★	A well-crafted lens, with fast and quiet AF with good vignetting and distortion control	•	•	95	72	91.5	84.0	1025g
EF 85mm f/1.8 USM	£470	2/11	5★	Non-rotating front ring thanks to rear focusing system, as well as USM	•	•	85	58	75	71.5	425g
TS-E 90mm f/2.8	£1670	NYT		Said to be the world's first 35mm-format telephoto lens with tilt and shift movements	•	•	50	58	73.6	88	565g
EF 100mm f/2 USM	£559	NYT		A medium telephoto lens with a wide aperture, making it ideal for portraits	•	•	90	58	75	73.5	460g
EF 100mm f/2.8 Macro USM	£650	11/09	4★	A solid performer, but weak at f/2.8 (which is potentially good for portraits)	•	•	31	58	79	119	600g
EF 100mm f/2.8 L Macro IS USM	£1060	1/13	5★	Stunning MTF figures from this pro-grade macro optic	•	•	30	67	77.7	123	625g
EF 100-400mm f/4.5-5.6 L IS USM	£1940	NYT		L-series construction and optics, including fluorite and Super UD elements	•	•	180	77	92	189	1380g
EF 135mm f/2 L USM	£1360	NYT		L-series construction with two UD elements and wide maximum aperture	•	•	90	72	82.5	112	750g
EF 135mm f/2.8 SF	£520	NYT		Soft-focus feature with two degrees of softness	•	•	130	52	69.2	98.4	390g
EF 180mm f/3.5 L Macro USM	£1870	NYT		L-series macro lens with inner focusing system and USM technology	•	•	48	72	82.5	186.6	1090g
EF 200mm f/2 L IS USM	£7350	NYT		5-stop Image Stabilisation with tripod detection and Super Spectra lens coatings	•	•	190	52	128	208	2520g
EF 200mm f/2.8 L II USM	£960	NYT		Two UD elements and a rear-focusing system in this L-series optic	•	•	150	72	83.2	136.2	765g
EF 300mm f/2.8 L IS II USM	£7500	NYT		4 stop Image stabilisation makes this lens perfect for action photography	•	•	200	52	128	248	2400g
EF 300mm f/4 L IS USM	£1740	NYT		Two-stop image stabilisation with separate mode for panning moving subjects	•	•	150	77	90	221	1190g
EF 400mm f/2.8 L IS USM	£9810	NYT		Super telephoto with ring-type USM, one fluorite element and image stabilisation	•	•	300	52	163	349	5370g
EF 400mm f/4 DO IS USM	£8000	NYT		Multi-layer diffractive optical element to correct for chromatic aberration	•	•	350	52	128	232.7	1940g
EF 400mm f/5.6 L USM	£1660	NYT		Super UD and UD elements, as well as a detachable tripod mount and built-in hood	•	•	350	77	90	256.5	1250g
EF 500mm f/4 L IS USM II	£5299	NYT		Full-time manual focus, a single fluorite element and dust and moisture protection	•	•	450	52	146	387	3870g

NIKON

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT						Min Focus (m)	Filter Thread (mm)	DIMENSIONS		
						Cs	SLR	DSLR	DSLR	DSLR	DSLR			Width (mm)	Length (mm)	Weight
10-55mm f/2.8 G ED DX Fisheye	£678	NT		DX format fisheye lens with Nikon's Close-Range Correction system and ED glass								14	n/a	63	62.5	300g
10-24mm f/3.5-4.5 G ED AF-S	£834	10/09	4★	MTF performance is good from wide open to f/11, only breaking down past f/22								24	77	82.5	87	460g
12-24mm f/4 G ED AF-S DX	£1044	9/09	4★	This venerable optic may be a little weak at f/4, but otherwise it's a good performer								30	77	82.5	90	485g
14mm f/2.8 D ED AF	£1554	7/10	5★	A really nice lens that handles well and offers excellent image quality								20	n/a	87	86.5	670g
14-24mm f/2.8 G ED AF-S	£1670	2/08	5★	A remarkable piece of kit, producing sharp images with little chromatic aberration								28	n/a	98	131.5	970g
16mm f/2.8 D AF Fisheye	£762	NT		Full-frame fisheye lens with Close-Range Correction system and 25cm focus distance								25	n/a	63	57	290g
16-35mm f/4 G ED AF-S VR	£1072	6/10	5★	A fantastic lens that deserves to be taken seriously, with very little CA throughout								28	77	82.5	125	685g
16-80mm f/2.8-4E ED VR AF-S DX	£869	11/15	4★	This new standard zoom for DX-format users is designed as a travel lens for APS-C DSLRs								35	72	80	85.5	480g
16-85mm f/3.5-5.6 G ED VR AF-S DX	£574	3/11	4★	Boasting Nikon's second-generation VR II technology and Super Integrated Coating								38	67	72	85	485g
17-35mm f/2.8 D ED-IF AF-S	£1878	NT		High-quality wideangle zoom for full-frame Nikon users								28	77	82.5	106	745g
17-55mm f/2.8 G ED-IF AF-S DX	£1356	3/07	4★	A higher quality standard zoom for DX-format DSLRs								36	77	85.5	110.5	755g
18-35mm f/3.5-4.5 G ED AF-S	£669	Xmas13	5★	Wideangle zoom with instant manual-focus override for full-frame DSLRs								28	77	83	95	385g
18-55mm f/3.5-5.6 G II AF-S DX	£156	12/08	3.5★	Entry-level standard zoom lens								28	52	73	79.5	265g
18-55mm f/3.5-5.6 G VR AF-S DX	£188	5/08	4★	An improvement over the above version, with excellent resolution and the benefit of VR								28	52	70.5	74	205g
18-55mm f/3.5-5.6 G VR II AF-S DX	£229	NT		Popular 3x zoom lens that is remarkably compact and lightweight, offering great portability								28	52	66	59.5	195g
18-105mm f/3.5-5.6 G ED VR AF-S DX	£292	8/12	4.5★	Kit lens for Nikon D90 & D7000 with Silent Wave Motor and Vibration Reduction								na	67	76	89	420g
18-140mm f/3.5-5.6 G ED VR AF-S DX	£579	NT		A compact and lightweight DX-format zoom, this lens is a great all-rounder								45	67	78	97	490g
18-200mm f/3.5-5.6 G IF-ED AF-S	£762	10/11	4.5★	4-stop VR II system, two ED and three aspherical elements in this DX superzoom lens								50	72	77	96.5	560g
18-300mm f/3.5-5.6 G ED-IF VR	£850	12/12	4★	DX-format zoom lens with wideangle to super-telephoto reach								45	77	83	120	830g
18-300mm f/3.5-6.3 G ED VR	£849	NT		New DX-format 16.7x zoom with super-telephoto reach – a compact 'walkabout' lens								48	67	78.5	99	550g
20mm f/1.8 G ED AF-S	£679	NT		A fast FX-format prime lens that's compact and lightweight								20	77	82.5	80.5	335g
20mm f/2.8 D AF	£584	NT		Compact wideangle lens with Nikon's Close-Range Correction system								25	62	69	42.5	270g
24mm f/2.8 D AF	£427	NT		Compact wide lens with Close-Range Correction system								30	52	64.5	46	270g
24mm f/1.4 G ED AF-S	£1990	8/10	5★	Nothing short of stunning. Aside from its high price there is very little to dislike about this optic								25	77	83	88.5	620g
24mm f/1.8 G ED AF-S	£629	NT		Fast FX-format lens that aims to appeal to landscape, interior, architecture and street photographers								23	72	77.5	83	355g
24mm PC-E f/3.5 D ED PC-E	£1774	NT		Perspective Control lens with Nano Crystal Coating and electronic control over aperture								21	77	82.5	108	730g
24-70mm f/2.8 G ED AF-S	£1565	7/09	5★	An excellent set of MTF curves that show outstanding consistency, easily justifying the price of this lens								38	77	83	133	900g
24-85mm f/3.5-4.5 G ED VR	£520	XMAS 12	5★	FX-format standard zoom with Auto Tripod detection and VR								38	72	78	82	465g
24-120mm f/4 G ED AF-S VR	£1072	5/11	5★	Constant maximum aperture of f/4 and the addition of VR makes this a superb lens								45	77	84	103	710g
28mm f/1.8 G ED AF-S	£619	4/13	5★	If you crave a wide aperture and prefer a single focal length then this Nikon prime delivers								25	67	73	80	330g
28mm f/2.8 D AF	£282	NT		Compact wideangle lens with a minimum focusing distance of 25cm								25	52	65	44.5	205g
28-300mm f/3.5-5.6 G ED AF-S VR	£889	1/13	4.5★	Technical testing shows this zoom to be, as Nikon claims, the 'ideal walkabout lens'								50	77	83	114	800g
35mm f/1.8 G AF-S DX	£208	3/12	5★	Designed for DX-format DSLRs, a great standard prime lens								30	52	70	52.5	200g
35mm f/1.8 G ED AF-S	£180	NT		Fast FX-format prime lens with bright f/1.8 aperture. Versatile and lightweight								25	58	72	71.5	305g
35mm f/2 DAF	£324	9/08	3★	At wide-aperture settings this optic achieves respectable resolution, which decreases with aperture								25	52	64.5	43.5	205g
35mm f/1.4 G ED AF-S	£1735	9/12	5★	A Nano Crystal-coated lens designed for the FX range								30	67	83	89.5	600g
40mm f/2.8 G AF-S DX Micro	£250	12/11	5★	A budget-priced macro lens that delivers the goods on multiple fronts								20	52	68.5	64.5	235g
45mm PC-E f/2.8 D ED	£1774	NT		Perspective Control lens with ED glass and Nano Crystal Coating								25	77	83.5	112	780g
50mm f/1.2	£855	NT		Ultra-fast f/1.2 aperture prime lens								50	52	68.5	47.5	360g
50mm f/1.4 D AF	£292	2/10	5★	Entry-level prime puts in a fine performance while offering backwards compatibility with AI cameras								45	52	64.5	42.5	230g
50mm f/1.4 G AF-S	£376	2/10	5★	Internal focusing and superior AF drive makes this a good alternative to the D-series 50mm f/1.4								45	58	73.5	54	280g
50mm f/1.8 D AF	£135	NT		Compact, lightweight, affordable prime, will stop down to f/22								45	52	63	39	160g
50mm f/1.8 G AF-S	£200	9/11	5★	A cut-price standard lens for FX shooters or a short telephoto on DX-format DSLRs								45	58	72	52.5	185g
55mm f/2.8 Micro	£625	NT		Macro lens with 1/2 maximum reproduction ratio								25	52	63.5	62	290g
55-200mm f/4-5.6 G VR AF-S DX	£314	8/07	3.5★	Designed for DX-format cameras, with Vibration Reduction and SWM technology								110	52	73	99.5	335g
55-300mm f/4.5-5.6 G VR AF-S DX	£378	1/12	3★	Offers a wide telephoto coverage, but better options available								140	58	76.5	123	530g
58mm f/1.4 G AF-S	£1599	2/14	4★	FX-format full frame premium prime lens with large f/1.4 aperture								58	72	85	70	385g
60mm f/2.8 D AF Micro	£405	8/06	5★	Nikon's most compact Micro lens, with Close Range Correction (CRC) system								22	62	70	74.5	440g
60mm f/2.8 G ED AF-S Micro	£500	NT		Micro lens with 1:1 repro ratio, as well as a Silent Wave Motor and Super ED glass								18	62	73	89	425g
70-200mm f/2.8 G ED VR II AF-S	£2085	10/10	5★	Very little to fault here, with stunning image quality and consistent results at different focal lengths								140	77	87	209	1540g
70-200mm f/4 G ED VR	£1180	7/13	5★	Latest 70-200mm offers third-generation VR and weight savings over its more expensive f/2.8 cousin								1000	67	78	178.5	850g
70-300mm f/4.5-5.6 G ED AF-S VR	£556	11/10	4★	Feature-packed optic, with a VR II system, 9-bladed diaphragm, SWM and ED glass								n/a	67	80	143.5	745g
80-400mm f/4.5-5.6 G ED VR AF-S	£1899	10/15	5★	Successor to the 80-400mm f/4.5-5.6D ED VR, focusing is excellent at tracking fast-moving subjects								175	77	95.5	127	1570g
85mm f/3.5 G ED AF-S DX VR	£522	NT		DX-format Micro lens with a 1:1 reproduction ratio, VR II system and ED glass								28	52	73	98.5	355g
85mm f/1.4 G AF-S	£1532	2/11	5★	Fast mid-tele lens with an internal focusing system and rounded diaphragm								85	77	86.5	84	595g
85mm f/1.8 D	£385	NT		Portable medium telephoto – ideal for portraits								85	62	71.5	58.5	380g
85mm f/1.8 G AF-S	£470	5/12	5★	Rear-focusing system and distance window in this medium telephoto lens								80	67	80	73	350g
105mm f/2.8 G AF-S VR II Micro	£782	11/09	4.5★	A very sharp lens, with swift and quiet focusing and consistent MFT results								31	62	83	116	720g
105mm f/2 D AF DC	£980	NT		A portrait lens with defocus control								90	n/a	79	111	640g
135mm f/2 D AF DC	£1232	NT		Defocus-Image Control and a rounded diaphragm in this telephoto optic								110	n/a	79	120	815g
180mm f/2.8 D ED-IF AF	£782	NT		Useful telephoto length and internal focusing technology, together with ED glass								150	72	78.5	144	760g
200mm f/4 D ED-IF AF Micro	£1429	NT		1:1 reproduction range in this Micro lens, with a Close-Range Correction system								50	62	76	104.5	1190g
200mm f/2 G ED AF-S VR II	£5412	NT		A full-frame lens offering ghost-reducing Nano Crystal coating								190	52	124	203	2930g
200-500mm f/5.6 E ED VR AF-S	£1179	NT		A super-telephoto zoom lens compatible with Nikon FX-format DSLR cameras								220	95	108	267.5	2300g
300mm f/4 E PF ED VR AF-S	£1230	08/15	5★	Light, compact AF-S full-frame telephoto lens with ED glass elements								140	77	89	147.5	755g
300mm f/2.8 G ED AF-S VR II	£5209	NT		This lens promises fast and quiet AF, and is fitted with Nikon's latest VR II system								230	52	124	267.5	2900g



## OLYMPUS

OLYMPUS					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT								DIMENSIONS				
7-14mm f/4 ED	£1900	6/08	5★	An excellently constructed objective, with image quality to match			•						25	n/a	86.5	119.5	780g	
8mm f/3.5 ED Fisheye	£930	NYT		Diagonal fisheye lens, offering a 180° view and a splash-resistant construction			•						13	n/a	79	77	485g	
9-18mm f/4-5.6	£640	9/09	4★	Good results up to f/11, past which point resolution drops a little			•						25	72	79.5	73	280g	
12-50mm f/3.5-6.3 ED	£370	5/13	4★	Offers electromagnetic zoom mechanism plus variable zoom speed			•						20	72	57	83	211g	
12-60mm f/2.8-4 ED SWD	£1130	11/08	4.5★	While not quite as consistent as the 14-54mm, this optic is perhaps more versatile			•						25	72	79.5	98.5	575g	
11-22mm f/2.8-3.5	£1020	NYT		Wide angle (2x) addition to Olympus E-System lens range			•						28	72	75	92.5	485g	
14-35mm f/2 ED SWD	£2400	NYT		Pro lens with Supersonic Wave Drive AF system and dust and splashproof casing			•						35	77	86	123	915g	
14-42mm f/3.5-5.6 ED	£285	NYT		Small, light lens especially designed for the compact Four Thirds system standard			•						25	58	65	61	190g	
14-54mm f/2.8-3.5 II	£660	12/09	4★	An affordable lens with great resolution – only CA control lets it down a touch			•						22	67	74.5	88.5	440g	
18-180mm f/3.5-6.3	£560	6/10	4★	A good performer everywhere except at 180mm, with a solid feel to it			•						45	62	78	84.5	435g	
25mm f/2.8 Pancake	£270	9/08	3.5★	Excellent image quality from such a tiny optic, but the lens cap is a little fiddly			•						20	43	64	23.5	95g	
35mm f/3.5 Macro	£270	NYT		Macro lens equivalent to 70mm on a full-frame camera			•						14	52	71	53	163g	
35-100mm f/2	£2630	NYT		One Super ED and four ED elements inside this telephoto optic			•						140	77	96.5	213.5	1650g	
40-150mm f/4-5.6 ED	£300	NYT		ED and aspherical elements in this optic, together with an internal focusing system			•						90	58	65.5	72	220g	
50mm f/2 ED Macro	£600	8/06	3.5★	A fast, high-quality lens, with excellent MTF curves and low chromatic aberration			•						24	52	71	61.5	300g	
50-200mm f/2.8-3.5 ED SWD	£1300	NYT		Supersonic Wave Drive focusing system and an equivalent focal range of 100-400mm			•						120	67	86.5	157	995g	
70-300mm f/4-5.6 ED	£450	NYT		Three ED elements and multi-coatings feature in this popular tele-zoom optic			•						96	58	80	127	620g	
150mm f/2 ED	£2650	NYT		Splashproof telephoto lens with a wide maximum aperture			•						140	82	100	150	1610g	

## PENTAX

PENTAX					Image Stabilisation														
					Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min focus (m)	Filter thread (mm)	Width (mm)	Length (mm)	Weight			
LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT										DIMENSIONS				
DA 10-17mm f/3.5-4.5 smc ED IF	£590	NYT		Fisheye zoom lens with Super Protection coating and Quick Shift manual focus							•	14	n/a	71.5	68	320g			
DA 12-24mm f/4 smc ED AL IF	£1050	NYT		Two aspherical elements, ELD glass and a constant aperture of f/4 in this wide zoom							•	30	77	83.5	87.5	430g			
DA 14mm f/2.8 smc ED IF	£730	7/10	4.5★	Best performance lies between f/5.6 and f/11, but good results can be had at f/4 too							•	17	77	83.5	69	420g			
DA 15mm f/4 smc ED AL Limited	£820	NYT		Limited edition lens with hybrid aspherical and extra-low dispersion elements							•	18	49	39.5	63	212g			
DA* 16-50mm f/2.8 smc ED AL IF SDM	£950	1/09	3.5★	A nice balance and robust feel, but poor sharpness at f/2.8 (which significantly improves from f/4 onwards)						•	•	30	77	98.5	84	600g			
DA 16-85mm f/3.5-5.6 ED DC WR	£600	NYT	I	Weather-resistant, this zoom features a round shaped diaphragm to produce beautiful bokeh							•	35	72	78	94	488g			
DA 17-70mm f/4 smc AL IF SDM	£630	NYT		Featuring Pentax's Supersonic Direct-drive (SDM) focusing system							•	28	67	75	93.5	485g			
DA 18-50mm f/4-5.6 DC WR RE	£230	NYT		Super-thin standard zoom that's weather-resistant and features a round shaped diaphragm							•	30	58	71	41	158g			
DA 18-55mm f/3.5-5.6 smc II ED AL IF	£220	1/09	3.5★	Something of a bargain. Only the maximum apertures and awkward manual focusing really let it down							•	25	52	68	67.5	220g			
DA 18-55mm f/3.5-5.6 smc AL WR	£229	NYT		A weather resistant construction and an aspherical element, as well as SP coating							•	25	52	68.5	67.5	230g			
DA 18-135mm f/3.5-5.6 DA ED DC WR	£600	6/11	3.5★	A weather resistant mid-range zoom lens							•	40	62	73	76	405g			
DA 18-270mm f/3.5-6.3 smc ED SDM	£699	NYT		15x superzoom for company's K-mount DSLRs featuring two extra-low dispersion (ED) elements							•	49	62	76	89	453g			
DA 20-40mm f/2.8-4 ED Limited DC WR	£829	NYT		With state-of-the-art HD coating, a completely round-shaped diaphragm, and weather-resistant							•	28	55	68.5	71	283g			
DA 21mm f/3.2 smc AL Limited	£600	NYT		This limited-edition optic offers a floating element for extra-close focusing							•	20	49	63	25	140g			
FA 31mm f/1.8 smc AL Limited	£1149	NYT		Aluminium body; when used on a Pentax DSLR offers a perspective similar to that of the human eye							•	30	58	68.5	65	345g			
FA 35mm f/2 smc AL	£550	NYT		A compact wideangle lens that weighs a mere 214g							•	30	49	64	44.5	214g			
DA 35mm f/2.8 smc Macro	£640	9/08	4.5★	Despite slight edge softness, this lens performs excellently and is a pleasure to use							•	14	49	46.5	63	215g			
DA 35mm f/2.4 smc DS AL	£180	3/12	5★	A budget price prime lens for beginners							•	30	49	63	45	124g			
DA 40mm f/2.8 smc Limited	£450	NYT		Pancake lens with SMC coating and Quick Shift focusing system							•	40	49	63	15	90g			
DA 40mm XS f/2.8 XS	£325	NYT		The world's smallest fixed focal length lens							•	40	N/A	62.9	9	52g			
FA 43mm f/1.9 smc Limited	£729	NYT		Focal length is ideal for portraits as well as everyday use, and features an smc multi-layer coating							•	45	49	27	64	155g			
FA 50mm f/1.4 smc	£399	NYT		High quality fast prime. The 'FA' indicates that its image circle covers the 35mm full-frame format							•	45	49	63.5	38	220g			
DA 50mm f/1.8 smc DA	£249	08/15	4★	Affordable short telephoto lens ideal for portraits							•	•	45	52	38.5	63	122g		
DFA 50mm f/2.8 smc Macro	£550	NYT		Macro lens capable of 1:1 reproduction and with a Quick Shift focus mechanism							•	•	19	49	60	67.5	265g		
DA* 50-135mm f/2.8 smc ED IF SDM	£1200	11/12	4★	Constant f/2.8 aperture; well suited to portraiture and mid-range action subjects							•	•	100	67	76.5	136	765g		
DA 50-200mm f/4-5.6 smc ED WR	£210	NYT		Weather-resistant construction, Quick Shift focus system and an SP coating							•	n/a	49	69	79.5	285g			
DA* 55mm f/1.4 smc SDM	£800	2/10	4.5★	Even despite questions about the particular sample tested, this lens scores highly							•	•	45	58	70.5	66	375g		
DA 55-300mm f/4-5.8 smc ED	£370	10/12	4★	The lens boasts a useful focal range, as well as a dirt-resistant SP coating							•	•	140	58	75	111.5	440g		
DA 55-300mm f/4-5.8 ED WR	£399	NYT		Weatherproof HD telephoto lens featuring quick shift focusing system							•	•	140	58	71	111.5	466g		
DA 60-250mm f/4 smc ED IF SDM	£1450	10/12	4.5★	With a constant f/4 aperture and an ultrasonic motor for speedy focusing							•	•	110	67	167.5	82	1040g		
DA 70mm f/2.4 smc AL Limited	£600	NYT		Medium telephoto lens with an aluminium construction and a Super Protect coating							•	•	70	49	63	26	130g		
D-FA* 70-200mm f/2.8 ED DC AW	£1850	NYT		New addition to Pentax's high-performance Star (*) series developed for best image rendition							•	•	120	77	91.5	203	1755g		
FA 77mm f/1.8 smc Limited	£1050	NYT		With Pentax's Fixed Rear Element Extension focusing system for 'sharp, crisp images'							•	•	70	49	48	64	270g		
D-FA 100mm f/2.8 Macro	£700	NYT		Designed for both digital and film cameras, this macro lens boasts a 1:1 repro ratio							•	•	30	49	67.5	80.5	345g		
D-FA 100mm f/2.8 Macro WR	£680	11/12	5★	Street price makes this something of a bargain for a true macro offering full-frame coverage							•	•	30	49	65	80.5	340g		
FA 150-450mm f/4.5-5.6 ED DC AW	£2000	NYT		Super-telephoto lens with weather-resistance, designed to produce extra-sharp, high-contrast images							•	•	200	86	241.5	95	2000g		
DA* 200mm f/2.8 smc ED IF SDM	£1000	8/12	4.5★	SDM focusing system on the inside, and dirtproof and splashproof on the outside							•	•	120	77	83	134	825g		
DA* 300mm f/4 smc ED IF SDM	£1300	NYT		This tele optic promises ultrasonic focus and high image quality thanks to ED glass							•	•	140	77	83	184	1070g		
DA 560mm f/5.6 ED smc AW	£5999	NYT		Prime offering focal length of 859mm when mounted on Pentax K-mount DSLR. Treated with HD coating							•	•	560	112	130	522	3040g		



# Photographers on Safari

www.photographersonsafari.com

✉ info@photographersonsafari.com



## Golden Eagle Experience in Leicestershire

2016 Dates

£99

April 10th, May 8th; Golden Eagle will fly, and perch in carefully chosen natural settings. Jesses hidden for static shots. Controlled flying. Also selection from; Owls, Buzzard, Hawks, Goshawk. Max. 8 photographers.

## Cheetahs, Lions, Foxes, Birds of Prey, Cambs.

£119

April 9th, May 7th; Privileged access to Cheetahs, Bengal Tiger, White Tiger & Corsac Foxes. The Cheetah & Tiger enclosures are not mowed for enhanced photographic opportunities. Private Displays by various Birds of Prey, both static & flying. Jesses hidden for static shots. Barn Owl, Eagle Owl and Red-Tailed Hawk etc.

## Amazing Bat Photos & Learn Fill-in Flash Techniques

£139

April 14th, 15th; Oxfordshire. Take amazing bat photos. Learn how to use balanced fill-in flash on wildlife subjects in different lighting conditions. Max 4 persons. Free loan of Canon digital camera and flash if req'd.

## Big Cats at WHF, Smarden in Kent

£155

April 2nd, April 23rd, April 30th; Up close to African Lions, Bengal + Siberian + Sumatran Tigers, Serval, Cheetah, Pumas, Jungle Cat, Amur & Snow Leopards, Black Leopards, Clouded Leopards, Fishing Cat. Large open enclosures. UK's most popular photo workshop. Really special photo opportunities from just inches away. Two sets of Lion Cubs born July & August 2013. Huge natural enclosure. Max 12 clients.

## Big Cats at WHF, Smarden in Kent - Specialist event 6 photographers - incl. Jaguar

£199

March 31st, April 1st, 22nd, 29th; Full day as above, but with additional space at each enclosure. Time is also put aside to review your photos at lunchtime. One to one tuition throughout this very special day. You will see all the animals as above and you will have more personal interaction with the cats. Now including Jaguar.

Gift Vouchers available for any Workshop or for any Monetary Value.

These Experiences make Wonderful Gifts for that Special Occasion.

## Gorillas & African Safari Experience, Port Lympne

£155

April 3rd, 24th, May 1st, 2nd; 3 gorilla sessions. No wires, fences or bars throughout the day. Clean back-grounds plus Privileged Access. Photograph at eye level over moat. Huge male silverbacks + family group. Private VIP Safari for 2.5 hours. Rhinos, Wildebeest, Eland, Zebras, Giraffes, Buffalo, Ostriches, various Deer.

## Birds of Prey Workshop, Bedford

£99

April 16th, 17th; Private flying displays on pre-determined flightpath helps you to focus on birds in flight. Excellent opportunities with carefully chosen backgrounds. Also static shots in outstanding natural locations. Jesses carefully hidden. This location boasts one of the largest collections of Birds of Prey in the UK. White tailed Sea Eagle, Bald Eagles, Hawks, Owls, Falcons, Kestrels, Buzzards and Long Eared Owl (new).

## Foxes, Otters, Wildcats, Badgers & more, Surrey.

£145

July 13, 14, 15; Inside enclosures 'til sunset. Also Owls, Snakes, Badgers, Polecats, Weasels, Stoats, Hedgehog, Harvest Mice & various Deer. 2 sessions with the foxes, sometimes only inches away from you. Inside enclosures with Foxes, Otters, Scottish Wildcats. Badgers GUARANTEED. No fences or wires to shoot through.

## Small Cats Workshop, Welwyn, Herts.

£99

April 4, 25, 28; Privileged access to Snow Leopards, Amur Leopards, Pumas, Caracal, Leopard Cat, Lynx, Servals, Golden Cat. As featured on recent series of TV programs on Animal Planet. Small groups. Tuition

## Bass Rock Gannets

£225

June 5th, 12th, 20th, 23rd; Private boat. Exclusive use of island for just 10 photographers. 50,000 pairs of nesting gannets on one small island. 4.5 hours photography. Amazing close-ups & fantastic flight shots. Large crate of fish fed to gannets as they dive into the sea. An amazing sight that you will never forget.

## Gannets diving off Bass Rock

£99

June 24th; Fantastic new workshop for 2014. We sail round Bass Rock without landing on the island. A whole hour of throwing fish into the sea for the Gannets to catch. Amazing diving shots. 1,000 + dives. Tuition.

## Farne Islands Puffins (Over 5 hrs photography)

£89

June 4th, 11th, 17th, 25th; 20 species of birds. 50,000 puffins. Guillemots, Razorbills, Shag, Arctic Tern colony etc. You will get unbelievably close to some of the species. Get that much sought after shot of Puffins with their beaks crammed full of sand eels. Tips and Tuition. Approximately 5 hours photography.

## Pro Birds of Prey Shoot, Bamburgh, Northumberland.

£139

June 18th, 19th; Amazing photography opportunities. Hill top views overlooking large extensive valleys and seascapes. Rocks and gorse bushes abound. Golden Eagle, Peregrine Falcon, Snowy Owl, Eagle Owl and Barn Owl will be placed in really natural situations. Jesses will be hidden where possible for those perfect "in the wild" shots. Can combine with Bass/Farne as this location is very close to the Farne Islands.

## Pro Birds of Prey Shoot (2) with Short Eared Owl, Northumberland.

£139

June 14th, 21st, 27th; Both the falconer and the birds are different to workshop above. Venues are about 20 miles apart. We will take two of the birds down to an amazingly beautiful, little known waterfall. This will provide a unique backdrop for your subjects. The falls are surrounded by trees covered with mosses and lichens. We will photograph up to 10 different species of birds, mainly British. Maximum 8 photographers.

## Small Mammals, Insects & Reptiles

## NEW WORKSHOP

£199

June 6, 7; Indoor studio set-ups ensuring professional quality photos of stunning subjects. Studio lighting set up for you. Triggers to fit your camera supplied. Cameras and lenses can be loaned without charge. Innovative set-ups to maximise your opportunities. Max 4 persons. Harvest Mice, Red Eyed Tree Frogs, Praying Mantis, Locust, Bearded Dragon, Scorpion, Tarantula, Snakes, Lizards etc.

## Birds of Prey on Lindisfarne (Holy Island) incl. Short Eared Owl NEW WORKSHOP

£139

JUNE 2, 3; New workshop for 2016. Photograph a Short Eared Owl in its natural habitat before continuing with selection from Eagle Owl, Long Eared Owl, Barn Owl, Buzzard, Kestrel, Little Owl, Tawny Owl using boats, Lindisfarne Castle, boat houses & fishing props as backdrops.



For more information, please visit the website or call John Wright on 01664 474040 or 07779 648850 (preferred). We will be most happy to discuss any workshop in detail, or to send more detailed leaflets to anyone without internet access. Photographers on Safari, West End Studios, 55 Stapleford Road, Whissendine, Oakham, Rutland. LE15 7HF



## SAMYANG

SAMYANG					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT								DIMENSIONS			
8mm f/3.5 UMC Fisheye CS II	£274	NYT		Wideangle fisheye lens designed for digital reflex cameras with APS-C sensors		•	•	•	•				30	N/A	75	77.8	417g
10mm f/2.8 ED AS NCS CS	£429	NYT		Features a nano crystal anti-reflection coating system and embedded lens hood		•	•	•	•	•			24	N/A	86	77	580g
14mm f/2.8 ED UMC	£279	NYT		Ultra wideangle manual focus lens; bulb-like front element means no filters can be used		•	•	•	•			•	28	N/A	94	87	552g
16mm f/2.0 ED AS UMC CS	£389	NYT		Ultra wideangle lens for digital reflex cameras and mirrorless compact cameras fitted with APS-C sensors		•	•	•	•				20	N/A	89.4	83	583g
24mm f/1.4 AS UMC	£499	NYT		Fast ultra wideangle manual focus lens comprising 13 lenses arranged in 12 groups		•	•	•	•			•	25	77	95	116	680g
24mm f/3.5 AS T-S ED AS UMC	£789	NYT		Wideangle tilt-shift prime featuring 16 glass elements and f/3.5 maximum aperture		•	•	•	•			•	20	82	110.5	113	680g
35mm f/1.4 AS UMC	£369	3/13	4.5★	While manual focus only, this prime impressed us in real-world use, making it something of a bargain		•	•	•	•			•	30	77	83	111	660g
35mm T1.5 AS UMC VDSLR	£419	NYT		VDSLR version of 35mm f/1.4 AS UMC with de-clicked aperture ring for silent operation when used for video		•	•	•				•	30	77	83	111	660g
85mm f/1.4 IFMC	£239	NYT		Short fast telephoto prime, manual focus, aimed at portrait photographers		•	•	•	•			•	100	72	78	72.2	513g
100mm f/2.8 ED UMC Macro	£389	NYT		Full-frame compatible, the Samyang 100mm is a close-up true Macro lens		•	•	•	•			•	30	67	72.5	123.1	720g

## SIGMA

SIGMA					Image Stabilisation	MOUNT						Min focus (cm)	Filter Thread (mm)	DIMENSIONS			
LENS	RRP	TESTED	SCORE	SUMMARY	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only			Width (mm)	Length (mm)	Weight	
4.5mm f/2.8 EX DC	£739	NYT		Circular fisheye lens designed for digital, with SLD glass and a gelatin filter holder		•	•	•				13	n/a	76	77.8	470g	
8mm f/3.5 EX DG	£799	NYT		The world's only 8mm lens equipped with autofocus also boasts SLD glass		•	•	•	•			13	n/a	73.5	68.6	400g	
8-16mm f/4.5-5.6 DC HSM	£800	10/10	4★	Excellent performance at 8mm which sadly drops at the 16mm end	•	•	•	•	•			24	72	75	105.7	555g	
10mm f/2.8 EX DC	£599	NYT		A Hyper Sonic Motor (HSM) and built-in hood in this diagonal fisheye lens		•	•	•	•			13	n/a	75.8	83	475g	
10-20mm f/3.5 EX DC HSM	£650	3/10	5★	An absolute gem of a lens that deserves a place on every photographer's wish list	•	•		•	•	•		24	82	87.3	88.2	520g	
10-20mm f/4-5.6 EX DG HSM	£550	8/09	5★	A fine all-rounder, thanks to MTF curves which stay above 0.25 cycles-per-pixel down to f/16	•	•	•	•	•	•		24	77	83.5	81	470g	
12-24mm f/4.5-5.6 EX DC HSM	£868	8/09	4★	A tightly matched set of MTF curves, but APS-C users are advised to look at the 10-20mm instead	•	•		•	•	•	•	28	n/a	87	102.5	600g	
15mm f/2.8 EX DG	£629	7/10	4★	This fisheye optic puts in a very solid performance – not to be dismissed as a gimmick!	•	•		•	•	•	•	15	n/a	73.5	65	370g	
17-50mm f/2.8 EX DC OS HSM	£689	NYT		FLD and aspherical elements, a constant f/2.8 aperture and Optical Stabilisation	•	•	•	•	•	•		28	77	83.5	92	565g	
17-70mm f/2.8-4 DC Macro OS HSM	£449	NYT		Redesign of this well-received lens launches the 'Contemporary' range and sees it in more compact form	•	•	•	•	•	•		22	72	79	82	470g	
18-35mm f/1.8 DC HSM	£799	11/13	5★	Said to be the world's first constant f/1.8 zoom; DOF equivalent of constant f/2.7 on full frame		•	•	•	•	•	•	28	72	78	121	810g	
18-200mm f/3.5-6.3 DC	£349	3/08	3★	Good CA control at 200mm but otherwise an average performer	•	•		•	•	•	•	45	62	70	78.1	405g	
18-200mm f/3.5-6.3 DC OS	£449	3/08	4★	Excellent resolution and consistent performance, but control over CA could be a little better	•	•		•	•	•	•	45	45	79	100	610g	
18-250mm f/3.5-6.3 DC OS HSM	£572	1/10	4.5★	A very capable set of MTF curves that only shows minor weakness at wide apertures	•	•	•	•	•	•	•	45	72	79	101	630g	
18-250mm f/3.5-6.3 DC Macro OS HSM	£500	NYT		Ultra-compact 13.8x high zoom ratio lens designed exclusively for digital SLR cameras	•	•	•	•	•	•		35	62	73.5	88.6	470g	
18-300mm f/3.5-6.3 DC Macro OS HSM	£499	NYT		Compact and portable high ratio zoom lens offering enhanced features to make it the ideal all-in-one lens	•	•		•	•	•	•	39	72	79	101.5	585g	
24mm f/1.4 DG HSM   A	£799	06/15	5★	The latest addition to Sigma's 'Art' line of high-quality fast primes		•	•	•	•	•	•	25	77	85	90.2	665g	
24-35mm f/2 DG HSM   A	£949	12/15	5★	The world's first large-aperture full-frame zoom offering a wide aperture of f/2 throughout the zoom range		•	•	•	•	•	•	28	82	87.6	122.7	940g	
24-70mm f/2.8 EX DG IF HSM	£899	8/09	5★	Not perfect, but an excellent alternative to Canon and Nikon's 24-70mm lenses, with great MTF curves	•	•		•	•	•	•	38	82	88.6	94.7	790g	
24-105mm f/4 DG OS HSM   A	£849	3/14	4.5★	Serious full frame alternative to own-brand lenses at a lower price but with no compromises in the build	•	•	•	•	•	•	•	45	82	89	109	885g	
30mm f/1.4 EX DC HSM	£490	9/08	3★	A consistent performer, with slightly weaker but not unacceptable performance wide-open	•	•	•	•	•	•	•	40	62	76.6	59	430g	
35mm f/1.4 DG HSM   A	£799	9/13	5★	Large aperture prime; first lens in company's 'Art' series	•	•		•	•	•	•	30	67	77	94	665g	
50mm f/1.4 EX DC HSM	£459	2/10	5★	This lens may be priced above the norm, but it delivers results which are similarly elevated	•	•	•	•	•	•	•	45	77	84.5	68.2	505g	
50mm f/1.4 DG HSM Art	£849	7/14	4★	This lens is a unique design that pays off in truly excellent image quality	•	•		•	•	•	•	40	77	85.4	100	815g	
50-500mm f/4.5-6.3 DG OS HSM	£1499	4/11	4★	A 10x zoom range, SLD elements and compatibility with 1.4x and 2x teleconverters	•	•	•	•	•	•	•	50-180	95	104.4	219	1970g	
70-200mm f/2.8 EX DG OS HSM	£1539	NYT		Two FLD glass elements, said to have the same dispersive properties as fluorite	•	•	•	•	•	•	•	140	77	86.4	197	1430g	
70-300mm f/4-5.6 APO DG Macro	£235	NYT		A 9-bladed diaphragm and two SLD elements in this tele-zoom lens	•	•		•	•	•	•	95	58	76.6	122	550g	
70-300mm f/4-5.6 DG Macro	£173	5/09	3★	Generally unremarkable MTF curves, and particularly poor at 300mm	•	•		•	•	•	•	95	58	76.6	122	545g	
85mm f/1.4 EX DG HSM	£890	2/11	5★	The Sigma's resolution from f/4 to f/8 is excellent	•	•	•	•	•	•	•	85	77	86.4	87.6	725g	
105mm f/2.8 EX DG OS HSM	£649	12/11	4.5★	An optically-stabilised macro lens	•	•	•	•	•	•	•	31.2	62	78	126.4	725g	
120-300mm f/2.8 DG HSM	£3599	NYT		First lens in company's 'Sports' series; switch enables adjustment of both focus speed and focus limiter	•	•	•	•	•	•	•	150-250	105	124	291	TBA	
150mm f/2.8 EX DG OS HSM	£999	NYT		A macro lens offering image stabilisation	•	•		•	•	•	•	38	72	79.6	150	950g	
150-500mm f/5-6.3 DG OS HSM	£999	6/09	3★	Significant softness at wide maximum apertures for all focal lengths	•	•	•	•	•	•	•	220	86	94.7	252	1780g	
150-600mm f/5-6.3 DG OS HSM   S	£1599	1/15	4★	This portable, high-performance telephoto zoom from Sigma's Sports line is dust and splashproof	•	•		•	•	•	•	260	105	121	290.2	2860g	
180mm f/2.8 EX DG OS HSM	£1499	4/13	5★	1:1 macro lens featuring three FLD glass elements and floating inner focusing system	•	•	•	•	•	•	•	47	86	95	204	1640g	
300mm f/2.8 APO EX DG	£2899	NYT		Extra Low Dispersion (ELD) glass, multi-layer coatings and a Hyper Sonic Motor	•	•		•	•	•	•	250	46	119	214.5	2400g	
300-800mm f/5.6 EX DG HSM	£6999	NYT		A constant aperture of f/5.6 throughout the expansive 300-800mm zoom range	•	•		•	•	•	•	600	46	156.5	544	5880g	
500mm f/4.5 APO EX DG	£4799	NYT		Telephoto lens with multi-layer coatings to 'optimise the characteristics of DSLRs'	•	•		•	•	•	•	400	46	123	350	3150g	
800mm f/5.6 APO EX DG	£5499	NYT		HSM and compatibility with Sigma's 1.4x EX APO and 2x EX APO teleconverters	•	•		•	•	•	•	700	46	156.5	521	4900g	

## SONY

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT						Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma					
11-18mm f/4.5-5.6 DT	£609	9/09	3★	A solid overall performance that simply fails to be outstanding in any way		•						25	77	83	80.5	360g
16mm f/2.8 Fisheye	£709	NTT		Fisheye lens with a close focusing distance of 20cm and a 180° angle of view		•					•	20	n/a	75	66.5	400g
16-35mm f/2.8 ZA SSM T*	£1729	9/09	4.5★	High-end Zeiss wideangle zoom lens ideal for full frame Alpha DSLRs		•					•	28	77	83	114	900g
16-50mm f/2.8 SSM	£569	4/12	4★	Bright short-range telephoto lens		•					•	100	72	81	88	577g
16-80mm f/3.5-4.5 ZA T*	£709	4/09	4.5★	Carl Zeiss standard zoom lens		•					•	35	62	72	83	445g
16-105mm f/3.5-5.6 DT	£559	3/09	3★	An ambitious lens that is good in parts. Quality drops off at 105mm		•					•	40	62	72	83	470g
18-135mm f/3.5-5.6 DT SAM	£429	NTT		A versatile zoom with Direct Manual Focus	•	•					•	45	62	76	86	398g
18-200mm f/3.5-6.3 DT	£509	4/08	3★	While the focal range is certainly useful, the lens is an overall average performer	•	•					•	45	62	73	85.5	405g
18-250mm f/3.5-6.3 DT	£559	1/10	3.5★	Good overall, but performance dips at longer focal lengths	•	•					•	45	62	75	86	440g
20mm f/2.8	£559	9/11	3.5★	Wideangle prime lens with rear focusing mechanism and focus range limiter		•					•	25	72	78	53.5	285g
24mm f/2 ZA SSM T*	£1119	NTT		An impressively bright wideangle Carl Zeiss lens		•					•	19	72	78	76	555g
24-70mm f/2.8 ZA SSM T*	£1679	7/09	5★	Carl Zeiss mid-range zoom lens with superb optics ideal for full frame Alpha DSLRs		•					•	34	77	83	111	955g
28-75mm f/2.8 SAM	£709	NTT		A constant f/2.8 aperture and a Smooth Autofocus Motor (SAM) in this standard zoom		•					•	38	67	77.5	94	565g
30mm f/2.8 DT SAM Macro	£179	3/12	4★	Macro lens designed for digital with 1:1 magnification and Smooth Autofocus Motor		•					•	12	49	70	45	150g
35mm f/1.4 G	£1369	NTT		With an equivalent focal length of 52.5mm, a wide aperture and aspherical glass		•					•	30	55	69	76	510g
35mm f/1.8 DT SAM	£179	NTT		Budget price indoor portrait lens		•					•	23	55	70	52	170g
50mm f/1.8 DT SAM	£159	3/10	4.5★	A very useful lens that performs well and carries a rock-bottom price tag		•					•	34	49	70	45	170g
50mm f/1.4	£369	2/10	5★	While this lens performs well overall, performance at f/1.4 could be better		•					•	45	55	65.5	43	220g
50mm f/1.4 ZA SSM	£1300	Web	4★	Carl Zeiss design said to be ideal for quality-critical portraiture and low-light shooting		•					•	45	72	81	71.5	518g
50mm f/2.8 Macro	£529	NTT		A macro lens with a floating lens element		•					•	20	55	71.5	60	295g
55-200mm f/4-5.6 DT SAM	£219	NTT		Designed for cropped-sensor DSLRs, with a Smooth Autofocus Motor		•					•	95	55	71.5	85	305g
55-300mm f/4.5-5.6 DT SAM	£309	NTT		Compact, lightweight telephoto zoom offering smooth, silent operation		•					•	140	62	77	116.5	460g
70-200mm f/2.8 G	£1889	NTT		Super Sonic Wave motor and a constant f/2.8 aperture in this pro-grade tele zoom		•					•	120	77	87	196.5	1340g
70-200mm f/2.8 G SSM II	£TBC	NTT		High-performance G Series telephoto zoom lens		•					•	120		87	196.5	1340g
70-200mm f/4 G OSS	£949	10/14	4★	Compact, lightweight telephoto zoom lens for full-frame E-mount bodies	•	•					•	100	72	80	175	840g
70-300mm f/4.5-5.6 G SSM	£869	12/10	3.5★	G-series lens with ED elements, Super Sonic wave Motor and a circular aperture		•					•	120	62	82.5	135.5	760g
70-400mm f/4-5.6 G SSM II	£1799	NTT		Redesign of original features a new LSI drive circuit and promises faster autofocus		•					•	150	77	95	196	1500g
75-300mm f/4.5-5.6	£219	8/12	3★	Compact and lightweight zoom with a circular aperture		•					•	150	55	71	122	460g
85mm f/1.4 ZA Planar T*	£1369	NTT		Fixed focal length lens aimed at indoor portraiture		•					•	85	72	81.5	72.5	560g
85mm f/2.8 SAM	£219	NTT		A light, low price portraiture lens		•					•	60	55	70	52	175g
100mm f/2.8 Macro	£659	NTT		Macro lens with circular aperture, double floating element and wide aperture		•					•	35	55	75	98.5	505g
135mm f/1.8 ZA Sonnar T*	£1429	NTT		A bright, Carl Zeiss portrait telephoto lens		•					•	72	77	84	115	1004g
135mm f/2.8 STF	£1119	NTT		Telephoto lens with defocus effects		•					•	87	80	80	99	730g

## TAMRON

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT						Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma					
10-24mm f/3.5-4.5 SP AF Di II LD Asph. IF	£511	2/10	3.5★	Good consistency at 10mm and 18mm, but a steep decline at 24mm		•	•		•			24	77	83.2	86.5	406g
14-150mm f/3.5-5.8 Di III	£370	NTT		The first Micro Four Thirds lens from Tamron, for compact mirrorless interchangeable-lens cameras				•				50	52	63.5	80.4	285g
15-30mm f/2.8 SP Di VC USD	£950	07/15	4★	Excellent value, this is the only wideangle zoom with image stabilisation and an f/2.8 aperture	•	•	•					28	N/A	98.4	145	1100g
16-300mm f/3.5-6.3 Di II VC PZD Macro	£600	8/14	4★	Versatile megazoom, a very good all-in-one solution, as long as you won't need to enlarge to A2 size	•	•	•	•				39	67	99.5	75	540g
17-50mm f/2.8 SP AF XR Di II LD Asph. IF	£450	2/09	4.5★	Very good optical performance, which peaks at f/5.6-8		•	•	•	•			27	67	74	81.7	434g
17-50mm f/2.8 SP AF XR Di II VC LD Asph. IF	£541	4/10	4.5★	Very strong performance at longer focal lengths but weaker at the other end	•	•	•	•				29	72	79.6	94.5	570g
18-200mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£306	3/08	3★	Excellent CA control in the centre, but unremarkable wideangle performance	•	•	•	•				45	62	73	83.7	423g
18-200mm f/3.5-6.3 AF Di II VC Asph. IF Macro	£300	NTT		Lightweight all-in-one lens with Vibration Compensation	•	•	•	•				49	62	75	96.6	400g
18-270mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£613	1/10	4.5★	Much better results at shorter focal lengths than longer ones, but still impressive	•	•	•	•				49	72	79.6	101	550g
18-270mm f/3.5-6.3 AF Di II VC LD PZD IF Macro	£663	10/11	3★	The next-generation incarnation offers a new form of ultrasonic engine	•	•	•	•				49	62	74.4	88	450g
24-70mm f/2.8 SP Di VC USD	£1099	10/12	5★	Fast zoom with image stabilisation for both full-frame and APS-C cameras	•	•	•	•				38	82	88.2	116.9	825g
28-75mm f/2.8 SP AF XR Di LD Asph. IF Macro	£460	NTT		Standard zoom with constant f/2.8 aperture and minimum focusing distance of 33cm		•	•	•	•		•	33	67	73	92	510g
28-300mm f/3.5-6.3 AF XR Di LD Asph. IF Macro	£664	NTT		A useful 10.7x zoom range and low-dispersion elements in this optic		•	•	•	•		•	49	62	73	83.7	420g
28-300mm f/3.5-6.3 Di VC PZD	£529	NTT		A new, full-frame, high-power zoom incorporating PZD (Piezo Drive)	•	•	•	•			•	49	67	75	99.5	540g
60mm f/2 SP AF Di II LD IF Macro	£550	12/10	5★	Macro lens designed for APS-C sensor cameras, with 1:1 reproduction ratio		•	•	•				23	55	73	80	400g
70-200mm f/2.8 SP AF Di LD IF Macro	£817	10/09	4★	No image stabilisation and no advanced AF system, but at this price it's a steal		•	•	•	•		•	95	77	89.5	194.3	1150g
70-200mm f/2.8 Di VC USD	£TBC	NTT		Compact yet full-size telephoto zoom with vibration compensation		•	•	•	•			130	77	85.8	188.3	1470g
70-300mm f/4-5.6 SP VC USD	£300	1/12	4★	Ultrasonic Silent Drive (USD) technology for focusing and Vibration Compensation		•	•	•	•		•	150	62	81.5	142.7	765g
70-300mm f/4-5.6 AF Di LD Macro	£170	11/10	3.5★	Low dispersion glass and compatible with both full-frame and cropped-sensor DSLRs		•	•	•	•		•	95	62	76.6	116.5	435g
90mm f/2.8 SP AF Di Macro	£470	11/09	4★	A very nice macro lens that is capable of producing some fine images		•	•	•	•		•	29	55	71.5	97	405g
90mm f/2.8 Di Macro 1:1 VC USD	£TBC	NTT		Redesign of the 90mm f/2.8 SP AF Di Macro; comes with vibration compensation		•	•	•	•		•	30	58	115	76.4	550g
150-600mm f/5-6.3 SP VC USD	£1150	6/14	4★	Longest focal length of any affordable enthusiast zoom on the market and produces excellent results	•	•	•	•				270	95	105.6	257.8	1951g
180mm f/3.5 SP AF Di LD IF Macro	£896	11/10	5★	Two Low Dispersion elements and internal focusing system in this 1:1 macro lens		•	•	•	•		•	47	72	84.8	165.7	920g
200-500mm f/5-6.3 SP AF Di LD IF	£1124	6/09	4.5★	A well-matched and consistent set of MTF curves, with good performance at f/8-11		•	•	•	•		•	250	86	93.5	227	1237g



TOKINA

LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT						DIMENSIONS		
AT-X 107 (10-17mm) f/3.5-4.5 AF DX Fisheye	£550	NYT		Fisheye zoom lens with Water Repellent coating and Super Low Dispersion glass		•	•	•	14	n/a	70	71.1	350g	
AT-X 116 (11-16mm) f/2.8 PRO DX	£515	6/12	4.5★	Wide zoom with a One-Touch Focus clutch mechanism and a constant f/2.8 aperture		•	•		30	77	n/a	89.2	560g	
AT-X 12-28mm f/4 PRO DX	£529	NYT		Replacement for 12-24mm F4 wideangle zoom; for Nikon DX DSLRs		-	•		25	77	84	90	600g	
AT-X 16-28mm f/2.8 PRO FX	£757	6/11	5★	A pro-end wideangle zoom aimed at full frame cameras		•	•	•	26	n/a	90	133	950g	
AT-X 17-35mm f/4 PRO FX	£830	11/12	5★	One of the most capable super-wide zooms available, though only available in Canon and Nikon mounts		•	•		28	82	89	94	600g	
AT-X 16.5-135 (16.5-135mm) f/3.5-5.6	£610	9/11	3.5★	Three aspherical and two SD elements, together with a useful focal range		•	•		50	77	84	78	610g	
AT-X M100 (100mm) f/2.8 AF PRO D Macro	£360	11/09	4★	Some weaknesses wide-open, but reasonable MTF curves make this a decent optic		•	•	•	30	55	73	95.1	540g	

ZEISS

LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT								DIMENSIONS		
12mm f/2.8 Touit Distagon T*	£959	5/14	5★	Designed specifically for Sony NEX and Fujifilm X-series CSC cameras. Very impressive performance			•					18	67		68	270g
18mm f/3.5 ZF.2	£1150	8/10	5★	No AF, but the optical and build qualities of this lens are nothing short of stunning		•		•	•	•		30	82	84	87	470g
21mm f/2.8 Distagon T*	£1579	NYT		A wideangle lens that doesn't compromise on optical quality		•		•	•	•		30	82	87	84	510g
25mm f/2 Distagon T*	£1350	NYT		A landscape lens with a fast aperture		•		•	•	•		25	67	71	95	570g
25mm f/2.8 Distagon T*	£750	NYT		A macro lens offering unrivalled quality		•		•	•	•		17	58	83	55	480g
28mm f/2 Distagon T*	£850	NYT		For low light shooting the 28mm lens has plenty of potential		•		•	•	•		24	58	64	93	520g
32mm f/1.8 Touit Planar T*	£700	7/14	4.5★	Optimised for use with APS-C format sensors, a fast standard lens for Fujifilm X-series cameras			•					23	52	72	76	200g
35mm f/1.4 Distagon T*	£1600	NYT		Promises to produce some stunning bokeh effects		•		•	•	•		30	72	120	122	850g
35mm f/2 Distagon T*	£940	NYT		An extremely fast focusing lens		•		•	•	•		30	58	64	97	530g
50mm f/1.4 Planar T*	£650	NYT		A portrait lens in its element in low light		•		•	•	•		45	72	66	69	350g
50mm f/2 Makro-Planar	£665	NYT		A macro lens with impressive-looking levels of sharpness		•		•	•	•		24	67	72	88	530g
100mm f/2 Makro-Planar	£1399	NYT		A rapid-focus portrait lens		•		•	•	•		44	72	76	113	680g

CSC Lens Listings

The range of lenses for CSC models is constantly evolving, so you have a fairly good choice when it comes to lenses for your CSC

CANON CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT					Min Focus (m)	Filter Thread (mm)	DIMENSIONS		
						Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q			Width (mm)	Length (mm)	Weight
EF-M 18-55mm f/3.5-5.6 IS STM	£269	NYT		Compact and versatile zoom lens		•	•				25	52	61	61	210g
EF-M 11-22mm f/4-5.6 IS STM	£355	NYT		Ultra-wideangle lens with a compact, retractable lens design		•	•				15	55	61	58.2	220g
EF-M 22mm f/2 STM	£220	NYT		Small and bright wideangle pancake lens		•	•				15	43	61	23.7	105g
EF-M 55-200mm f/4.5-6.3 IS STM	£330	NYT		Telephoto zoom that takes you closer to the action		•	•				100	52	60.9	86.5	260g

FUJI CSC

LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT				DIMENSIONS				
XF 10-24mm f/4 R OIS	£849	NYT		Ultra wideangle lens, minimal ghosting with Fujis HT-EBC multi-layer coating	•			•	•	24	72	78	87	410
XF 14mm f/2.8 R	£729	7/13	5★	Ultra wideangle prime, high resolution to all corners, performance justifies price tag				•	•	18	58	65	58.4	235g
XF 16mm f/1.4 R WR	£729	10/15	5★	Weather-sealed fast prime for X-system users				•	•	15	67	73.4	73	375g
XC 16-50 f/3.5-5.6 OIS	£359	NYT		Lightweight lens for mirrorless X-series offers 24-75mm equivalent zoom range	•			•	•	30	58	62.6	98.3	195g
XF 16-55mm f/2.8 R LM WR	£899	06/15	5★	A flagship XF standard zoom lens with a constant f/2.8 aperture and weather-resistance				•	•	60	77	83.3	106	655g
XF 18mm f/2 R	£430	6/13	4★	A compact, wideangle lens with a quick aperture				•	•	18	52	64.5	40.6	116g
XF 18-135mm f/3.5-5.6 R LM OIS WR	£699	Xmas14	4★	Weather-resistant zoom for Fujifilm X mount, designed to be the perfect partner for the Fujifilm X-T1	•			•	•	45	77	75.7	97.8	490g
XF 18-55mm f/2.8-4 R	£599	NYT		Short zoom lens with optical image stabilisation				•	•	18	58	65	70.4	310g
XF 23mm f/1.4 R	£649	NYT		Premium wideangle prime lens with fast maximum aperture				•	•	28	62	72	63	300g
XF 27mm f/2.8	£270	NYT		A high-performance single-focal-length lens				•	•	60	39	23	61.2	78g
XF 35mm f/1.4 R	£439	6/13	4★	Shallow depth of field and bokeh effects are simple to achieve with this lens				•	•	28	52	65	54.9	187g
XF 50-140mm f/2.8 R LM OIS WR	£1249	NYT		A telephoto zoom with a constant maximum aperture and weather-resistance				•	•	100	72	82.9	175.9	995g
XC 50-230mm f/4.5-6.7 OIS	£315	NYT		The XC lens range is designed to suit Fuji's mid range CSCs, and this lens has optical image stabilisation	•			•	•	110	58	69.5	111	tbc
XF 55-200mm f/3.5-4.8 R LM OIS	£599	11/13	4★	Telephoto with built-in optical image stabilisation plus aperture control ring	•			•	•	110	62	118	75	580g
XF 56mm f/1.2 R	£899	9/14	4★	This wide-aperture portrait lens for X series cameras has great sharpness and detail and is great value				•	•	70	62	73.2	69.7	405g
XF 56mm f/1.2 R APD	£1090	NYT		Medium-telephoto prime lens, with fast f/1.2 lens and built-in APD filter producing creamy bokeh				•	•	70	62	73.2	69.7	405g
XF 60mm f/2.4 XF R Macro	£599	NYT		A short telephoto lens perfect for macro work				•	•	26.7	39	64.1	70.9	215g

NIKON CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT						Min Focus (cm)	Filter Thread (mm)	DIMENSIONS		
						Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Flip X Mount	Full Frame only			
6.7-13mm f/3.5-5.6 VR 1	£459	NT		Compact, lightweight, ultra-wideangle zoom lens with Vibration Reduction for Nikon 1 system	•									25	52	56.5
10mm f/2.8	£229	2/12	4★	A wideangle lens for Nikon's 1 series of Compact System Cameras										20	40.5	55.5
10-30mm f/3.5-5.6 VR	£149	NT		Nikon's kit lens for the 1 series of CSC models	•									20	40.5	57.5
10-100mm f/4.5-5.6 VR PD-ZOOM	£679	NT		A powered zoom lens aided by the VR image stabilisation system on 1 system compacts	•									300	72	77
10-100mm f/4-5.6 VR 1	£499	NT		CX-format zoom lens with focal length range of 10-100mm (27-270mm 35mm equivalent)	•									35	55	60.5
11-27.5mm f/3.5-5.6	£179	NT		Compact standard zoom for Nikon 1 system										30	40.5	57.5
18.5mm f/1.8	£179	NT		Nikon's 1 series gains a traditional fast prime										20	40.5	56
30-110mm f/3.8-5.6 VR	£229	NT		A longer zoom lens, with image stabilisation, for the Nikon 1 series	•									100	40.5	60
32mm f/1.2	£799	NT		First 1 system lens to offer a silent wave motor and nano crystal coating										45	52	66
70-300mm f/4.5-5.6 VR	£TBC	NT		CX-format super-telephoto lens with a surprisingly compact body	•									7	62	73

OLYMPUS CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT						Min Focus (cm)	Filter Thread (mm)	DIMENSIONS		
						Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Flip X Mount	Full Frame only			
7-14mm f/2.8 ED Pro	£999	Web	4.5★	Super-wide-angle zoom lens that is dustproof, splashproof and freeze-proof	•		•							20	n/a	78.9
8mm f/1.8 Pro Fisheye	£799	Web		Fisheye lens with impressive image quality that's dustproof, splashproof and freeze-proof			•							12	n/a	62
9-18mm (Micro) f/4-5.6 ED	£630	NT		This super wideangle lens offers an equivalent focal range of 18-36mm in 35mm terms			•							25	52	56.5
12mm (Micro) f/2.0 ED	£739	1/12	5★	A wideangle fixed lens for the Micro Four Thirds system			•							20	46	56
12-40mm f/2.8	£899	NT		Weather-resistant wideangle zoom with a constant aperture of f/2.8			•							20	62	69.9
12-50mm (Micro) f/3.5-6.3 ED EZ	£349	NT		A reasonably-priced MFT zoom lens			•							20	52	57
17mm M.Zuiko f/1.8 MSC	£450	7/13	5★	Wide-aperture, wide-angle prime boasting excellent peak sharpness and no colour fringing			•							25	46	57
17mm (Micro) f/2.8 Pancake	£300	5/10	4★	Results are impressive across the most-used apertures given the wide angle of view offered			•							20	37	57
14-42mm (Micro) f/3.5-5.6 ED	£300	5/10	4★	Generally a good performer, but control over chromatic aberrations could be a little better			•							25	40.5	62
14-42mm II R (Micro) f/3.5-5.6	£269	NT		A redesigned variation of the standard kit lens			•							25	37	56.5
14-150mm (Micro) f/4-5.6 ED	£630	NT		Plenty of focal range is offered by this MFT lens			•							50	58	63.5
14-150mm II f/4-5.6	£550	NT		High-powered zoom for all your needs – from wideangle to telephoto – plus weather-resistance			•							50	58	63.5
25mm f/1.8	£370	NT		Compact prime lens with ultra-bright f/1.8 aperture	•		•							25	46	57.8
40-150mm f/2.8 ED	£1299	03/15	4★	This powerful 80-300mm 35mm equivalent focal length lens offers amazing portability for this pro class			•							70	72	79.4
40-150mm R (Micro) f/4-5.6	£309	NT		This middle-distance zoom lens has an 80-300mm 35mm equivalent focal length			•							90	58	63.5
45mm (Micro) f/1.8	£279	2/12	5★	Fast-aperture lens for taking portrait shots proved to be sharp, quiet and without colour fringing			•							50	37	56
60mm f/2.8 Macro	£450	NT		High-precision macro lens that's dustproof and splashproof			•							19	46	56
75-300mm II (Micro) f/4.8-6.7	£499	NT		Update featuring Zuiko Extra-low Reflection Optical coating said to reduce ghosting			•							90	58	69
75mm f/1.8 ED	£799	8/13	5★	Ultra-fast prime lens ideal for portraits and action shots			•							84	58	64

PANASONIC CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT						Min Focus (cm)	Filter Thread (mm)	DIMENSIONS		
						Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Flip X Mount	Full Frame only			
G 7-14mm f/4	£1300	5/10	5★	For a wideangle zoom, the overall level of resolution is very impressive			•							25	-	70
G 8mm Fisheye f/3.5	£730	NT		The world's lightest and smallest fisheye lens for an interchangeable lens camera			•							10	22	60.7
G 12mm 3D Lens f/12	£320	NT		Allows compatible cameras to shoot 3D images			•							60	-	57
G 12-32mm f/3.5-5.6 MEGA OIS	£270	NT		Very compact with a versatile zoom range and 3 aspherical lenses	•									20	37	55.5
G X 12-35mm f/2.8 X PZ POWER OIS	£1095	10/12	5★	Fast, high-quality standard zoom for Micro Four Thirds cameras	•									25	58	67.6
G 14mm f/2.5	£249	NT		Wideangle pancake lens which should suit landscape photographers										18	46	55.5
G 14-42mm II f/3.5-5.6 MEGA OIS	£375	NT		Addition of two aspherical elements helps make this lens smaller than previous version	•									20	46	56
G X 14-42mm f/3.5-5.6 X PZ POWER OIS	£369	2/13	4★	Powered zoom; impressive results in terms of both sharpness and chromatic aberration	•									20	37	61
G 14-45mm f/3.5-5.6 MEGA OIS	£189	NT		A lightweight and compact standard zoom featuring MEGA O.I.S. optical image stabilisation	•									30	52	60
G 14-140mm f/3.5-5.6 POWER OIS	£599	NT		Metal-bodied zoom featuring company's POWER O.I.S. optical image stabiliser	•									30	58	67
DG 15mm f/1.7 Leica DG SUMMILUX	£549	NT		High-speed prime with a compact metal body and includes 3 aspherical lenses to cut down distortion										20	46	36
G 20mm f/1.7	£300	NT		High-speed prime (40mm is the 35mm camera equivalent) with 2 aspherical lenses										20	46	63
DG 25mm f/1.4 DG SUMMILUX	£550	2/12	5★	A fast-aperture fixed focal length standard lens from Leica										30	46	63
G 30mm f/2.8 Macro MEGA OIS	£300	07/15	3★	Compact lens offering true-to-life magnification capability for better macro images	•									10	46	58.8
35-100mm E f/4-5.6 MEGA OIS	£300	NT		Telephoto zoom equivalent to 70-200mm on a 35mm camera	•									90	46	55.5
G X 35-100mm f/2.8 POWER OIS	£1099	NT		Telephoto zoom with Nano Surface Coating technology for dramatic reduction of ghosting and flare	•									85	58	67.4
42.5mm f/1.2 Leica DG POWER OIS	£1399	Web	5★	Mid-telephoto high-speed LEICA DG NOCTICRON lens with 2 aspherical lenses and ultra-wide aperture	•									50	67	74
G 42.5mm f/1.7 POWER OIS	£349	NT		Mid-telephoto lens with a 35mm equivalent of 85mm, its f/1.7 aperture promises a beautiful bokeh effect	•									37	31	55
G 45-150mm f/4-5.6 MEGA OIS	£280	2/13	4★	Compact, lightweight telephoto zoom comprising 12 elements in 9 groups	•									90	52	62
G X 45-175mm f/4-5.6 X PZ POWER OIS	£400	7/12	4★	A powered long focal length zoom lens	•									90	46	61.6
G 45-200mm f/4-5.6 MEGA OIS	£330	7/12	4★	Superzoom lens with three ED elements and Mega O.I.S. technology	•									100	52	70
G 100-300mm f/4-5.6 MEGA OIS	£550	7/11	4★	Long zoom lens offering optical image stabilization	•									100	52	70



## PENTAX CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Canon M Micro 4 Thirds Samsung NX Sony E Pentax Q Micro 1 Fujifilm X Mount Full frame only					
<b>3.8mm-5.9mm (Q System) f/3.7-4</b>	£429	NYT		Super-compact, ultra-lightweight wide zoom, equivalent to 17.5-27mm in the 35mm format			25	49	38	54	75g
<b>8.5mm (Q System) f/1.9 AL [IF]</b>	£149	NYT		Standard prime lens in the Q system			20	40.5	45.5	23	37g
<b>6.3mm (Q System) f/7.1</b>	£129	NYT		A wide lens for the Q system				N/A	40.6	25	21g
<b>11.5mm (Q System) f/9</b>	£49	NYT		Extremely thin Mount Shield Lens equivalent to 53mm in the 35mm format, offering a distinctive, velvety image			30	N/A	6.9	40.8	8g
<b>18mm (Q System) f/8</b>	£129	NYT		A telephoto lens for the Q system				N/A	40.6	19.5	18g
<b>3.2mm (Q System) f/5.6</b>	£149	NYT		A fisheye lens for the Q system			90	N/A	40.6	30.5	29g
<b>5-15mm (Q System) f/2.8</b>	£279	NYT		A short zoom lens for the Q system				40.5	45.5	23	37g
<b>5-15mm (Q System) f/2.8-4.5</b>	£299	NYT		A standard zoom lens for the Q system equivalent to 27.5-83mm in the 35mm format			30	40.5	48.5	48	96g
<b>15-45mm (Q System) f/2.8</b>	£279	NYT		A telephoto zoom lens for the Q system that's super-compact and ultra-lightweight			100	40.5	56	50	90g

## SAMSUNG CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Canon M Micro 4 Thirds Samsung NX Sony E Pentax Q Micro 1 Fujifilm X Mount Full frame only					
<b>9mm f/3.5 ED</b>	£149	NYT		At 12.5mm thin, this pancake lens is constructed of solid metal, made for the NX Mini only			11	N/A	50	12.5	31g
<b>9-27mm f/3.5-5.6 ED OIS</b>	£199	NYT		Versatile and compact zoom lens – NX-M mount for NX Mini only	•		14	40.5	50	29.5	73g
<b>10mm f/3.5 Fisheye</b>	£399	NYT		Lightweight and compact, this versatile fisheye lens can be used with a wide range of Smart NX cameras			9	N/A	58.8	26.3	72g
<b>17mm NX-M f/1.8 OIS</b>	£160	NYT		Portrait prime lens designed with an NX-M Mount for the NX Mini	•		18	39	50	28	55g
<b>12-24mm f/4-5.6 ED</b>	£480	NYT		Portable ultra-wideangle zoom lens with i-function			24	58	63.5	65.5	208g
<b>16mm NX i-Function f/2.4</b>	£299	NYT		A pancake lens with a wide angle of view			18	43	61	24	90g
<b>16-50mm f/2-2.8 Premium S ED OIS</b>	£999	NYT		Bright-aperture zoom lens made of metal, with quiet AF performance whether shooting stills or video	•		30	72	81	96.5	622g
<b>16-50mm f/3.5-5.6 Power Zoom</b>	£279	NYT		Ultra-compact and lightweight design	•		24	43	64.8	31	111g
<b>20-50mm f/3.5-5.6 ED II</b>	£199	NYT		Ultra-compact lens with a retractable design. It's lightweight and an ideal optic for travelling			28	40.5	63.2	39.8	119g
<b>18-55mm NX i-Function OIS f/3.5-5.6</b>	£199	9/10	4.5★	Not an outstanding set of MTF curves but acceptable nevertheless. Weaker at 18mm			28	58	63	65	198g
<b>18-200mm NX i-Function OIS f/3.5-6.3</b>	£649	9/12	4.5★	A mid-range zoom lens aimed at movie making	•		50	67	72	105.5	549g
<b>20mm NX i-Function f/2.8</b>	£229	2/12	5★	Wideangle pancake lens			17	43	62	25	89g
<b>30mm NX i-Function f/2</b>	£249	9/10	4★	This pancake optic exhibits very impressive peak sharpness at around f/4-5.6			25	43	61	21	85g
<b>45mm NX i-Function f/1.8</b>	£249	NYT		Fast f/1.8 aperture produces a shallow depth of field making it ideal for portraiture			45	43	62	44.5	115g
<b>45mm NX i-Function f/1.8 2D/3D</b>	£399	NYT		Delivers high-end 3D capabilities with a large aperture and smooth autofocus system			50	43	62	44.5	122g
<b>50-150mm f/2.8 S ED OIS</b>	£1199	NYT		Premium zoom lens with advanced OIS, constant f/2.8 aperture, and dust and splash-resistant	•		70	72	81	154	915g
<b>50-200mm NX i-Function ED OIS III f/4-5.6</b>	£249	9/10	4★	Performance at the 50mm end is good, though this drops off at the tele end			98	52	70	100	417g
<b>60mm NX i-Function Macro ED SSA OIS f/2.8</b>	£499	2/12	5★	This prime lens with macro capability should be useful for portraiture	•		18	52	73.5	84	389g
<b>85mm NX i-Function ED SSA OIS f/1.4</b>	£849	4/12	5★	This prime lens is missing image stabilisation, but should still perform well			82	67	79	92	714g

## SIGMA CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Canon M Micro 4 Thirds Samsung NX Sony E Pentax Q Micro 1 Fujifilm X Mount Full frame only					
<b>19mm f/2.8 DN   A</b>	£189	NYT		Metal-bodied high-performance wideangle prime lens			20	46	60.8	45.7	150g
<b>30mm f/2.8 DN   A</b>	£189	NYT		Uses a high-quality double-sided aspherical lens for expressive performance worthy of Sigma's 'Art' line			30	46	60.8	40.5	140g
<b>60mm f/2.8 DN   A</b>	£189	NYT		Latest addition to Sigma's 'Art' range is a mid-range, high-performance telephoto lens with metal body			50	46	60.8	55.5	190g

## SONY CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Canon M Micro 4 Thirds Samsung NX Sony E Pentax Q Micro 1 Fujifilm X Mount Full frame only					
<b>10-18mm f/4</b>	£750	8/13	4★	Super wideangle zoom with Super ED glass and Optical SteadyShot image stabilisation	•		25	62	70	63.5	225g
<b>16mm f/2.8</b>	£220	2/12	4★	Pancake lens for NEX system, with a circular aperture and Direct Manual Focus			24	49	62	22.5	67g
<b>16-35mm f/4 ZA OSS Vario-Tessar T* FE</b>	£1289	1/15	5★	Zeiss full-frame wideangle zoom lens	•		28	72	78	98.5	518g
<b>16-50mm f/3.5-5.6 OSS</b>	£299	NYT		Compact lens with Power Zoom, ED glass and Optical SteadyShot image stabilisation			25	40.5	64.7	29.9	116g
<b>16-70mm f/4 ZA OSS Vario-Tessar T*</b>	£839	NYT		A lightweight, versatile mid-range zoom with a constant f/4 aperture			35	55	66.6	75	308g
<b>18-55mm f/3.5-5.6 OSS</b>	£270	NYT		Optical SteadyShot, said to be silent during movie capture, and a circular aperture			25	49	62	60	194g
<b>18-105mm f/4 G OSS</b>	£499	NYT		Sony G lens for E-mount cameras with a constant f/4 aperture			45	72	78	110	427g
<b>18-200mm f/3.5-6.3 OSS LE</b>	£489	NYT		Smaller and lighter than comparable lenses, this is an ideal high-magnification travel lens			50	62	68	98	440g
<b>18-200mm PZ f/3.5-6.3 OSS</b>	£999	NYT		Boasts powered zoom and image stabilisation with Active Mode, making it ideal for movies			30	67	93.2	99	649g
<b>20mm f/2.8</b>	£309	NYT		Pancake wideangle lens promises to be the perfect walkaround partner for E mount cameras			20	49	62.6	20.4	69g
<b>24mm f/1.8 ZA Sonnar T*</b>	£839	NYT		Top quality Carl Zeiss optic ideally suited to the NEX-7			16	49	63	65.6	225g
<b>24-240mm f/3.5-6.3 OSS</b>	£929	NYT		Ideal for travel, landscapes and more, with built-in stabilisation and also dust and moisture resistant	•		50	72	80.5	118.5	780g
<b>24-70mm f/4 ZA OSS Vario-Tessar T*</b>	£1049	NYT		Compact lens with an f/4 maximum aperture across the zoom range and built-in image stabilisation			40	67	73	94.5	426g
<b>28mm f/2</b>	£419	NYT		This full-frame wideangle prime with a bright f/2.0 maximum aperture promises excellent sharpness			29	49	64	60	200g
<b>28-70mm f/3.5-5.6 OSS</b>	£449	NYT		Built-in Optical SteadyShot image stabilisation, lightweight, and a popular zoom range	•		30	55	72.5	83	295g
<b>28-135mm PZ f/4 G OSS</b>	£2379	NYT		High performance G Series standard zoom lens, constant f/4 aperture, built for high quality moviemaking			95	95	162.5	105	1215g
<b>30mm f/3.5 Macro</b>	£219	NYT		A macro lens for the NEX Compact System Cameras			9	49	62	55.5	138g
<b>35mm f/1.4 ZA Distagon T*</b>	£1559	NYT		Full-frame ZEISS Distagon lens with large, bright f/1.4 aperture			30	72	73	94.5	630g
<b>35mm f/1.8</b>	£399	NYT		Lightweight versatile prime with Optical SteadyShot image stabilisation	•		30	49	62.2	45	155g
<b>35mm f/2.8 ZA Sonnar T*</b>	£699	NYT		When coupled with a full-frame Sony E-mount camera, this prime lens promises to deliver			35	49	61.5	36.5	120g
<b>50mm f/1.8</b>	£219	NYT		A handy, low price portrait lens for the NEX range			39	49	62	62	202g
<b>55mm f/1.8 ZA Sonnar T*</b>	£849	NYT		35mm full-frame prime lens with wide aperture allowing good images indoors or in low light			50	49	64.4	70.5	281g
<b>55-210mm f/4.5-6.3 OSS</b>	£289	NYT		Lightweight telephoto zoom lens for the NEX range	•		100	49	63.8	108	345g
<b>70-200mm f/4 G OSS</b>	£1359	10/14	4★	G Series telephoto zoom lens, dust and water resistant, with built-in image stabilisation	•		100	72	80	175	840g
<b>90mm f/2.8 Macro G OSS FE</b>	£1049	09/15	4★	The first dedicated macro lens for Sony's full-frame E-mount cameras	•		28	62	79	130.5	602g

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1080p  
movie mode



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6.0 fps  
1080p  
movie mode



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D7200

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megapixels  
6.0 fps  
1080p  
movie mode



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megapixels  
11.0 fps  
Full Frame  
CMOS sensor



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Black or Silver

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megapixels  
8.5 fps



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megapixels  
8 fps



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11.0 fps  
1080p  
movie mode



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8.0 fps  
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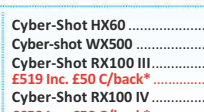


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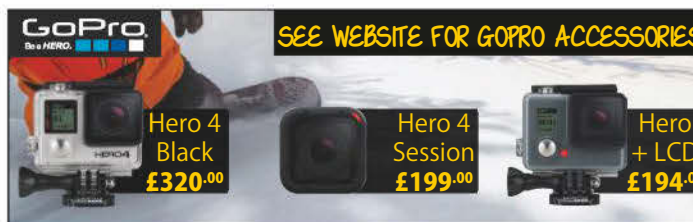
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## 7 things no wildlife photographer should be without

Think beyond tripods and lenses – there are many items you can festoon your kit bag with to make your life easier in the wild. We run through seven essentials.

### 1 Binoculars

In wildlife photography, you're going to spend a fair bit of time scouting for your targets, especially if you've got your heart set on a particularly rare or elusive beastie. To that end, you'll find life to be a whole lot easier if you get yourself some binoculars, as it's difficult and inefficient to scout with a camera and lens. A 10x pair will give you great visibility in a package that easily hangs off your belt. We'd recommend opting for a waterproof pair though...

### 2 A head torch

A lot of animals have the somewhat irritating habit of only rearing their little heads very early in the morning or very late at night. It'd be useful if they could all pop out at roundabout four in the afternoon when the light's nice and we could stroll home in time for tea, but those are the breaks. A head torch is useful in lots of ways – it not only lights your way on the walk to and from the location, but will also prove handy when it's 5:27 on a winter's morn and you're delving in your kit bag for that pesky spare SD card you saw a second earlier.

### 3 A penknife

Wildlife has an element of practicality to it, and having a penknife or other kind of multitool on your belt is no bad thing. A knife with a screwdriver attachment can be especially handy as it can allow you to make a quick and dirty adjustment to a loose tripod plate, meaning a loose screw doesn't need to ruin your session. The blade can also be used to pare back annoying branches. It can be your best friend – just remember not to bring it on your European birdwatching tour, lest airport security take offence.



### 4 A rain cover

In wildlife photography you're going to be outside a lot, and inevitably you'll get wet. Weather-proofing is great, but even the most rugged DSLRs can only take so much. That's where a rain cover comes in. This inexpensive piece of plastic will sit over your DSLR and allow you to operate its controls even in the wet. Get a long lens version and you'll have all you need.

### 5 A GoPro

GoPros are everyone's friend, and having one alongside your main wildlife camera is a great way to record some fun videos of your days out. Next time you have a particularly dull stretch of waiting for an animal to appear, you could set up a GoPro and start recording a timelapse. Its weatherproofing will mean you can leave it out in the rain, and its light build will ensure it doesn't add too much weight to your gear bag.



### 6 A teleconverter

A telephoto lens is something of a given in wildlife photography, but have you thought about pushing things even further? A teleconverter is a great way to optically extend your reach. It's worth spending a little extra cash and getting the official versions from your camera manufacturer of choice, as third-party teleconverters can compromise quality.

### 7 A right-angled viewfinder

One of the struggles of wildlife photography is that often you have to get down very low, which can be a major (literal) pain in the neck. A right-angled viewfinder will allow you to compose shots from a more comfortable position while still getting the camera where it needs to be. The Canon and Nikon units feature adjustable magnification levels and can be customised with adapters to fit your exact model of DSLR.





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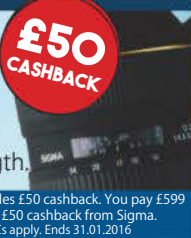
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